NEW!

BRITAIN'S BRIGHTEST AND BEST MAGAZINE FOR ACORN USERS

Acorn COMPUTING

JANUARY 1993 Vol.10 No.11 £2.95

Formerly THE MICRO USER

Special effects!

Brush up on top draw, paint and image creation packages

No coverdisk? ask your newsagent

CHRISTMAS HITS

Chopper Force plus 6 of the best new releases tested

Tune into programming

The best languages extensively reviewed

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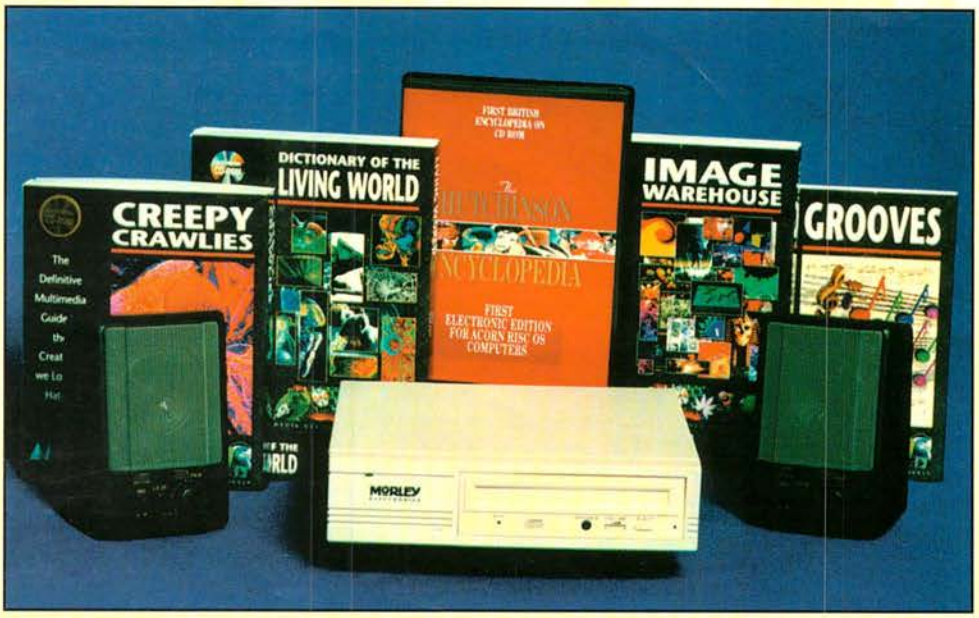
europress PUBLICATIONS

148 PAGES Vital hints & tips • BBC disk exchange • Customised icons • All the latest ne

SCSI CD ROM the collections from Morley



Morley Electronics are pleased to announce their new CD ROM bundle for the Acorn ARM powered range of computers. The system comprises of a Morley 16 bit SCSI card, a high quality externally cased CD ROM drive, a set of stereo speakers all cables necessary and a choice of four different collections of CD ROM discs.

The CD discs themselves are all RISC OS format and require no use of a PC Emulator whatsoever. They range from a disc which is crammed full of clip art to an encylopeadia of bugs, slugs and insects with full motion video clips in Acorn !Replay format.

The information on all of the discs can be accessed directly or if desired exported for use in other software. For instance the sound samples on the Grooves disc can be exported straight out to music packages for re-arranging.

The Collections

INCLUDED AS STANDARD

CD ROM Mechanism
16 bit Morley SCSI Card
All Cables
Stereo Speakers

COLLECTION 1
Grooves
Creepy Crawlies
Image Warehouse

COLLECTION 2
Grooves
Creepy Crawlies
Image Warehouse
Hutchinsons Encyclopedia

COLLECTION 3
Grooves
Creepy Crawlies
Image Warehouse
D.O.L.W.

COLLECTION 3
Grooves
Creepy Crawlies
Image Warehouse
Hutchinsons Encyclopedia
D.O.L.W.

Grooves

This is a unique music CD ROM featuring 100 professionally created clips of music. The music varies from classical to funk and the majority of clips are available in 8, 16 and 32 bar samples. The pieces themselves vary from short presentation strings or "musical dingbats" to compostions lasting one and a half minutes.

Using appropriate music software it is possible to build creative 'tunes' demonstrating different musical styles. All the clips come in ready to use formats and users can preview the tracks by using a special application in which an animated jukebox selects and plays the audio versions of the clips.

All samples can be exported as Sound Samples, Modules or as !Replay sound file. All are royalty free for non-profitable use.

Creepy Crawlies

A complete world of bugs, beetles and spiders engulfs the screen right in front of you. This new disc produced by Media Design Interactive has been formed specifically for the RISC OS format.

Offering an exciting introduction to the fascinating biology of these creatures. The information is in the form of text, pictures, narration/voice over and !Replay video material produced by the worlds leading biologists. A very useful feature is that the text descriptions can be set to display for either Key Stages 2/3 or 1/2.

Text, Sprites, !Replay frames and narration can all be exported directly for use in other programs.

Image Warehouse

The colour Image Warehouse is a vast selection of professionally created high quality images ideal for use in DTP, presentation and artwork in general.

The warehouse consists of five main sections as follows:

Artwork
Scans
Textures
Clip Art
Backgrounds

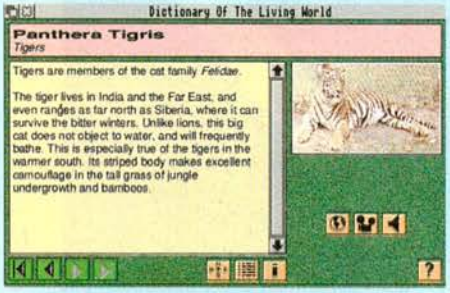
All images are in Sprite format in large and small Modes 15,28 perfect for use on all Acorn computers and monitors from the A3000 upwards. All are royalty free for non-profitable use.

Dictionary Of The Living World

This multimedia encyclopedia of Life on Earth incorporates text, pictures, sound, and !Replay video scenes. More than 2500 text entries are supplemented with over 1000 pictures, 100 animal sounds and 100 full motion video clips.

When a small picture such as the one below appears, the user simply double clicks in the picture and it is immediately displayed full screen in full 256 colours.

Ideal for educating students from 10 years upwards the Dictionary of the Living World can teach about the biology of life. All of the sprites and text files can be exported for later use and the !Replay video files can also be shown in isolation.



Hutchinsons Encyclopedia

This exciting CD ROM version of the Hutchinson encyclopedia is an up-to-date reference for vast amounts of informations available in seconds.

The package is fully RISC OS compliant and has over 25,000 entries and 7,500 biographies listed in its information. Searches can be carried out quickly and easily and then the results fine tuned even further by allowing further searches to be carried out on those that were successful from the first.

A very useful feature of the software is that all text and sprites can be exported from the software for use in projects or reports that you might be working on.

Individual Prices

CD ROM Collection 1	*£649.00*
CD ROM Collection 2	*£729.00*
CD ROM Collection 3	*£769.00*
CD ROM Collection 4	*£849.00*
CD ROM drive (External)	*£439.00*
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CD ROM drive (External) & cached SCSI interface	*£539.00*
CD Caddy	*£6.25*
External Loudspeakers	*£21.28*
RISC OS CD ROM DISCS	
Creepy Crawlies	*£99.00*
Grooves	*£59.00*
Image Warehouse	*£59.00*
Dictionary of the living world	*£175.00*
Hutchinsons Encyclopedia	*£99.00*
Frontier 2000	*£175.00*
Revelation 2	*£139.00*

CD ROM collections are suitable for all Acorn computers with 16 bit expansion slot. Some CD discs require 2MB RAM minimum and a multiscan monitor is recommended. All prices exclude VAT and carriage. E&OE Specifications subject to change. All trademarks acknowledged.

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COVER FEATURE

Paint the town red

EXPLORE a whole new world of graphic computer art with our reviews of the image processors Revelation Pro and Imagery; drawing packages and aids ArtWorks, Chameleon 2, Draw_Help and DrawAid; and take this opportunity to customise the icons on your Desktop.

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● *More info on the amazing ArtWorks package – see page 61*

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ORDER YOUR COPY NOW

The new look *Acorn Computing* is selling out fast at newsagents all around the country. Next month's issue is bound to go like hotcakes with more superb applications on the cover MegaDisk.

To make sure of your copy of Britain's best magazine for Acorn users turn to page 17 and reserve *Acorn Computing* with your local newsagent.

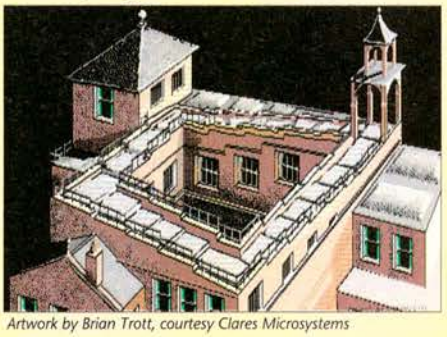
Bargains are back!

Turn to the reader classsified ads on page 112 and snap up the buy of the year.

Find out about the programs on this month's MegaDisk by turning the page

January subscription disk

This month's exclusive *Acorn Computing* subscriber-only disks feature an excellent selection of quality software.



Artwork by Brian Trott, courtesy Clares Microsystems

The Archimedes disk contains:
- An arcade game of pigs
- An amazing audio Illusion
- Up-to-date reviews listing
- Plus the best of PD software

The BBC Micro disk contains:
- Repton-style puzzle game
- Calendar utility for any month
- The telephone game
- Plus a great music demo

The MegaDisk

Populous: Total power for the megalomaniac

YOU are a divine being who makes decisions about the formation of the land, swamps, floods, earthquakes and even volcanoes. In this special interactive demo prepared exclusively for readers of *Acorn Computing* you are given one world from the full version to develop for good, depriving the evil tribe of land and conquest.

Your power is shown by the manna bar at the top of the detailed map. The shield above that lets you know just how you're doing. All the options open to you are on the chequered board and these are detailed in a textfile on the disk.

You can't divide and conquer if your followers are content. To keep them moving try the odd natural disaster. Terrain affects your people too – the flatter the land the easier it is to build. Big settlements take more time to build and populate but are handy in defence.

You can alter the options available to you via the scales icon on the chequer board. Experimentation makes the game easier or more difficult. The full version comes from Krisalis (0709 372290) at £29.99. It contains dozens of passworded levels, different landscapes and a level editor.

EXCLUSIVE SUBSCRIBER DISKS

See pages 25, 26, 28, 29

CADet: Easy design for all

CADet is a computer aided design package from Minerva (0392 437756) and is the little brother of the forthcoming ProCad from the same stable. It has been designed to be intuitive and easy to use. The CADet file contains two text files: One of notes on usage and a manual.

The user interface is designed to be similar to !Draw where appropriate. The full version of the product costs £149 and includes a plotter driver as a separate, multi-tasking application which operates in a similar way to a printer driver.

Plots are carried out in the background allowing you to continue working. As it is plotter rather than printer-oriented objects

should not be drawn so that large areas are covered or overlapped as the plotter won't be able to deal with them. This is also the reason that there are no *front* and *back* options as in Draw.

Most operations can be back-stepped using the Adjust button on the mouse or cancelled by a double-click of Adjust or by selecting a new tool.

All options are available to you via the on-screen menus but you'll find the keyboard shortcuts very useful indeed. A listing of these is given in the Manual textfile.

One of the features special to CADet are Snaps. These may be selected in combinations with Adjust over their icons. When snaps are on, the cross-hair will try to snap to the nearest sensible point on the drawing as the mouse is moved.

If this is successful, a sound and a change of pointer colour will indicate the snap and the icon on the status bar will be highlighted.

The Break tool requires you to click on a single point on an object and then it introduces a break in the object at that point. This may not have any visible effect but using Break again will separate a chunk which can then be removed.

The ability to convert a group to a symbol is the best way to create symbols and allows a new one to be added to the end of the list or inserted before the current symbol or the currently selected symbol to be replaced. But you cannot have groups inside symbols.

Getting started

THE programs on this disk are stored in a highly compressed format which sometimes enables as much as 1.6Mb of programs and data to be stored on a 800k floppy disk

The procedure for running the programs is very straightforward and does not require learning any special methods or techniq-ues.

Switch on your Acorn micro, put the disk in the drive and click the drive icon. The software that unpacks the programs, ArcFS 2, loads automatically ready for use. Double-click the Acorn Computing icon, the screen switches to the Acorn Computing logo and then, after a few seconds, back to the Desktop but now there's another window available.You can treat this new window just like any other one for viewing disk contents, you can run programs and open directories just by double-clicking them.

We recommend that you always read the !ReadMe files or access the help information via the Filer menu. See your Risc OS manuals for details.

THE start of a new year and to celebrate we have managed to squeeze four superb programs on to the cover disk, to provide something for everyone.

If you're in game mode there's Populous from Krisalis and Spheres of Chaos from Matt Black. Between them you can take part in some mindless mayhem or plan devious strategies.

If you are feeling more creative take a look at Imagery from Palette Studio, an art and image processing package. However, if CAD is more your forte, CADet by Minerva will let you design anything from maps to machines.

5.25in and 3.5in disk offer for BBC Micro users

We are making a special offer available to readers of *Acorn Computing* with a BBC Micro.

We will be happy to replace this month's *Acorn Computing* coverdisk with either a 5.25in or 3.5in BBC Micro disk. All you have to do is detatch the disk in its bag and return it, together with the form below, enclosing a 50p coin to cover part of the cost of post and packing.

Important: Please note that the replacement disk you receive will not include Populous, CADet, Imagery or Spheres of Chaos as these programs are not available for the 8-bit BBC Micro.

● *Offer available only within the United Kingdom*

Faulty disk

The cover disks are thoroughly tested at every stage of production, but inevitably when such a large batch of disks are duplicated, one or two bad ones will slip through. If you receive a faulty disk it will be replaced free of charge. Send it with your name and address to:

Stanley Precision, Unit F, Cavendish Courtyard, Sallow Road, Weldon North Indusrial Estate, Corby, Northants NN17 1JX.

If you damage the disk yourself, send it to the same address, but include a cheque or postal order for £1 (5.25in disk) or £1.50 (3.5in disk). If the disk has been damaged in transit, please return it to:

Europress Direct, Freepost, Ellesmere Port, South Wirral L65 3EB.

Spheres of Chaos: Watch out for the asteroid belt

WITH access to three levels of the full game, just double-click on the !Chaos demo icon. You'll be presented with a menu to customise the game to your way of playing.

To select a menu item use the mouse to move the spaceship pointer – it will turn white when it is active. Click on the item to either change the current menu or change a setting.

You can choose between keyboard and mouse control and the help file gives you all the details you need. Luckily the fire button auto-repeats – you'll probably need it. Some useful extra keyboard controls are pause, restart and single step while paused.

The instructions are simple, just shoot at everything – although there are bonuses if you pick up the triangular objects. The final version allows four people to play at once where you can either team-up or fight each other. Joystick support will also be built in.

The full version is £25 from Matt Black (0733 315439).

Imagery: Create, dissect and reassemble artwork

IMAGERY from Palette Studio (0604 832149) costs £89.95 and is described as an *image creation tool* aiming to take over where Paint stops. It has a host of special effects and picture enhancement functions for use on your own pictures too.

The version on the MegaDisk is called TinyImage – a cut-down version – and provides a good selection of the features available in the the full package. With it comes a tutorial in Edit format that will take you through creating your own artwork in easy-to-follow steps.

ORDER FORM

Please send me a BBC disk as indicated below.

Tape your 50p coin here

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Address.....

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BBC disk format required: ☐ 40 track 5.25in ☐ 80 track 5.25in ☐ 3.5in ADFS

Please send this completed form or a photocopy with the coverdisk in its bag and a 50p coin to:

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Closing date of offer is January 13, 1993. Please allow up to 28 days for delivery.

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Technical Reference Manual	£65.00

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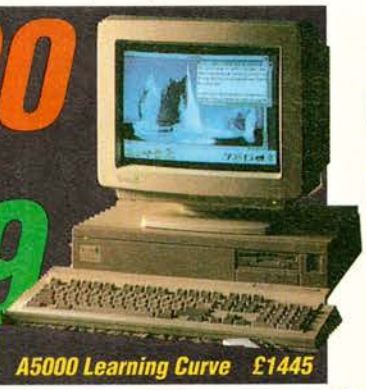

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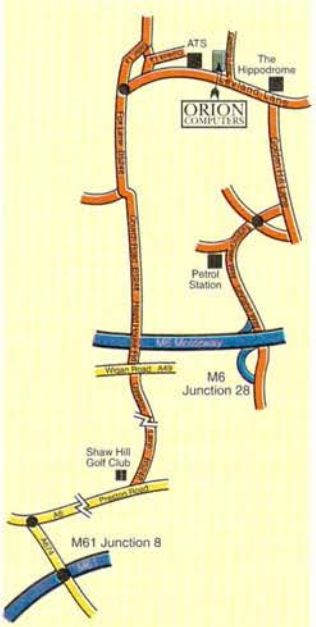

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A5000 Fitting Kit for second hard disc	ICS	£15
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A3000 4 Mb †	Atomwide/IFEL	£110•
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– as above + MEMC1a		£124•
– as above + MEMC1a + fitting		£154•
A310 4 Mb soldered + MEMC1a ‡	IFEL	£180•
– as above + fitting		£210•
A5000 2-4 Mb Non-upgradable †	Atomwide	£85
A5000 2-4 Mb Upgradable †	IFEL	£85•
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Bubble Jet BJ-10ex + TurboDriver	Canon/CC	£219•
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Laser Direct HiRes4 with 50-sheet tray	CC	£899
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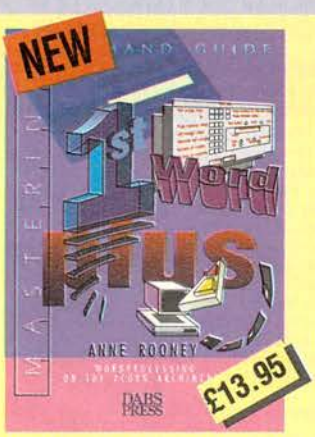

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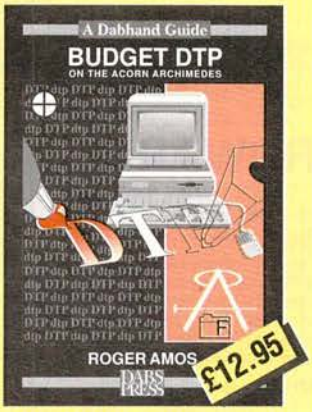

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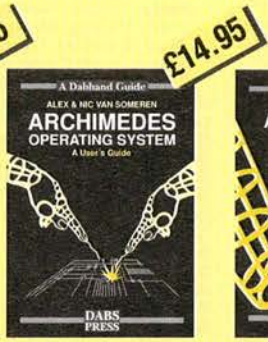

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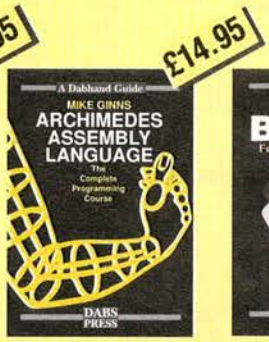

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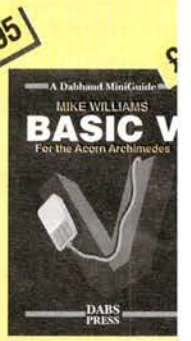

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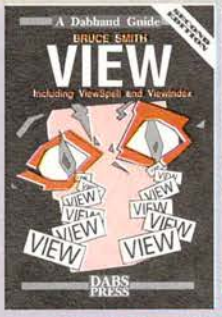

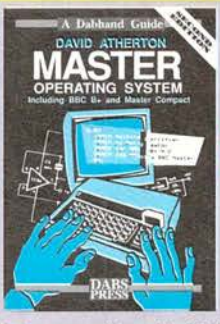

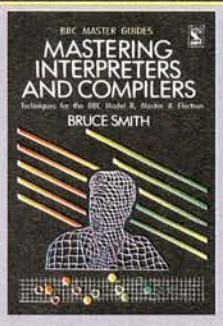

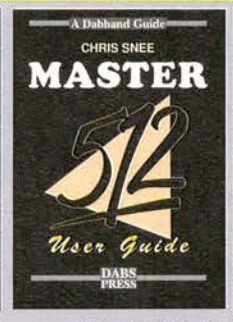

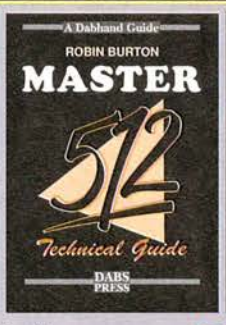

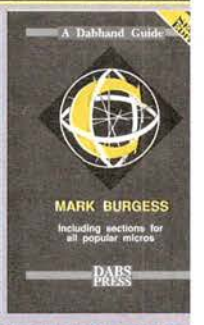

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Throwing away the car with full ashtrays

THE recent crisis in the London Ambulance Service's computer-assisted despatching system might seem nothing to do with Acorn with their home and education micros. And perhaps even further from the early hype of the Sinclair ZX80 and ZX81 as being powerful enough to run nuclear power stations.

But it has a lot to do with both.

What did the LAS do? In 1991 they introduced a central computer system that was supposed to help in assigning ambulances to emergencies and non-emergency activities.

From a programming viewpoint this is an apparently simple task, just a matter of assigning resources – the currently active ambulances – to tasks, the emergencies and non-emergencies.

But on closer inspection it isn't simple at all. There's a classic problem in programming called the Packing problem: Given a number of different sized objects and fixed space to put them into what's the best way of fitting them all together? *And there's no clever method that will solve it.*

The only solution is to try out every option and see which is the best fit, technically known as the *brute force* method. Assigning ambulances is a version of this problem, simplified a little because instead of working in three dimensions, the packing is only along one dimension: Time.

But complicated enormously by the fact that you don't know what objects (emergencies) are going to turn up even within the next 30 seconds and each object is going to have a different priority. And the size (time taken) of each object varies depending on the amount of traffic.

It didn't work properly and there were excessive delays with the loss of life being associated with the delays. So they bought a new computer which started running in mid-October 1992 and that one worked even worse.

But *why did they buy a new computer?*

A computer is just a piece of hardware which does absolutely nothing on its own, it needs software to do things, plus connections to the outside world. Any computer can be programmed to do anything – a ZX80 could be programmed to run a power station, but it probably wouldn't be fast enough to cope.

An Acorn A5000 can be programmed to calculate 1+1 and, in my experience anyway, usually comes up with 2. It's a gross under-utilisation of power but you can do it.

An A5000 could also be programmed to run a power station and it might stand a better chance than the ZX80. But the point is that it's the *software* that's important, not the hardware.

The ZX80 could be programmed to perform the functions required by the LAS system, so could the A5000, in fact a number of A5000s together could probably do the job quite satisfactorily – *but only if the software worked.*

So why did the LAS buy a new computer, probably costing about £250,000, instead of demanding that the software be re-written so that it worked? Who knows?

Being generous, the answer can only be ignorance: The idea that the computer *hardware* is at fault because the system didn't work properly, rather than the *software* not being up to the job.

Of course it's important to have a backup system just in case there *is* a hardware failure. But the LAS used the earlier, discredited, computer hardware and software as their backup when they realised how bad the new system was.

Why not get two identical computers and run the same software on both? If one fails you just switch to the other. Better still, why not use a system where the failure of one unit doesn't result in the entire machine crashing?

Until everyone who buys computers understands what they're dealing with, mistakes like this will continue to occur. Computer illiteracy could be fatal.

> A computer is just a piece of hardware which does absolutely nothing on its own, it needs software to do things, plus connections to the outside world.

Steve Turnbull

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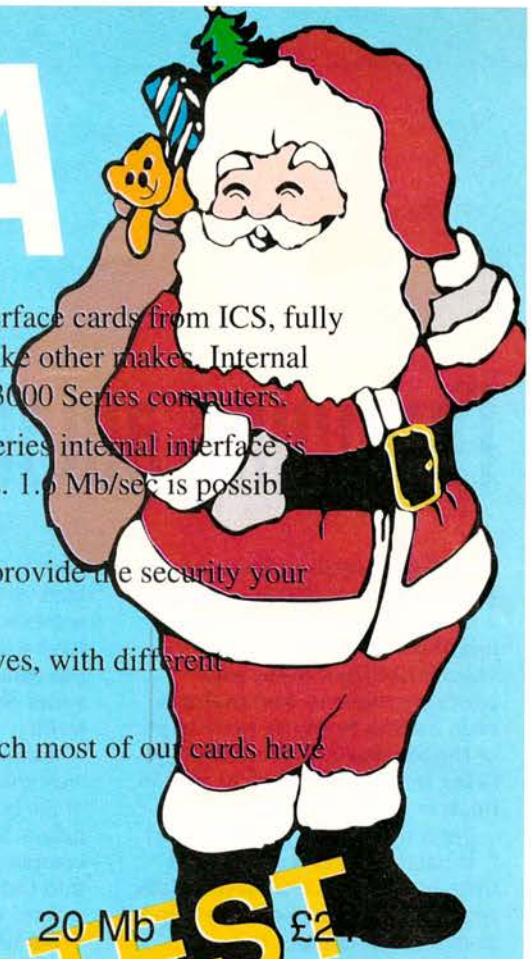

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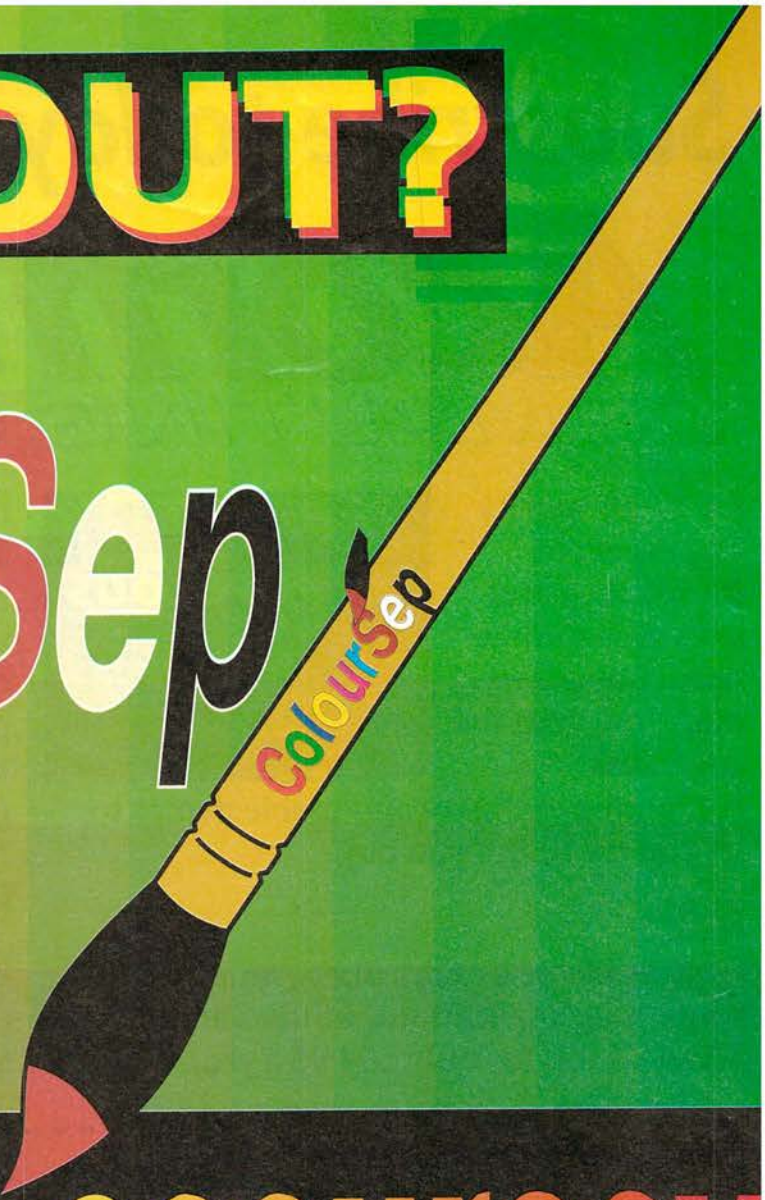
ColourSep + BJ-10 =



pinpoint accuracy

Pixel perfect colour registration on a BJ-10 even without a sheet feeder.

(We only hope this magazine advert is as good!)

ColourSep will also benefit users of ArtWorks and other colour separation software. Please call for details.

Any offers for a second-hand BJC-800?

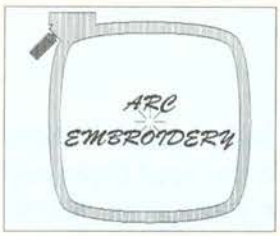
ICS (Ian Copestake Limited)

Dept AC4, 1 Kington road, West Kirby, WIRRAL, Merseyside, L48 5ET

Tel: 051-625 1006 Fax: 051-625 1007

Embroidering the facts

TECHSOFT (0824 3318) have released a system for the 32-bit range of machines which combines the POEM 500 micro-controlled embroidery machine with TechSoft's Arc Embroidery software.



This allows images to be created as drawfiles to be embroidered directly on to material.

The POEM 500 has no buttons or dials and is completely controlled from the computer. Its working area is 90x90mm and it will sew on to a wide range of materials from cotton to jersey. The software lets you define the styles with control of stitch – satin, ribbed, zig-zag and the like – as well as the size, length, fill density, direction and so on.

Simply assign the colours from Draw and Arc Embroidery does the rest, controlling the machine and prompting you for thread changes as and when necessary.

The POEM 500 and Arc Embroidery retail at £749.95.

Stars are out

TWO new entry-level dot-matrix printers have been launched by Star Micronics (0895 252131). The 9-pin LC100 Colour printer costs £219 with the 24-pin LC241 mono costing £239.

The LC100 Colour, though the least expensive colour printer on the market, still offers automatic selection of industry standard emulations, push tractor and paper parking as well as print speed of 180 cps in draft mode and 45 cps in NLQ mode.

The mono 24-pin printer, the LC241, features a compressed data mode, a unique facility which increases data transfer from the computer by up to 25 per cent. In addition there is a 16k buffer, multiple copies option and print speeds of 192 cps when in Draft and 64 cps in LQ mode.

Star's UK Sales and Marketing Director commented "... the launch of two such printers will not only underpin but increase Star's already dominant position in the UK entry level matrix market".

Digital improvements

Following the launch of the Colour Card developed in conjunction with Computer Concepts, Wild Vision (091-519 1455) have released a new version of their popular Hawk V9 digitiser.

The Hawk V9 Mark II is a single-width expansion card with the ability to dither built into the hardware. Not only does this enhance the quality of the live display, but the gives a good image at the very first grab with no need to wait for further processing.

This model can also display and grab 6-bit monochrome images which can be used in other desktop software to output up to 256 levels of grey. The new Hawk costs £269.

There is an upgrade offer for owners of some other real-time colour digitisers. If you send your old boards to Wild Vision plus £135 you'll receive a new Hawk V9 Mark II. This option is not open to HCCS Vision digitisers, Watford monochrome or Rombo colour digitisers.

Piling on the power

MORE information is now available on Raw Power, the next title due from Software 42. Duncan Millard started work on the game about a year ago after playing a couple of Super Nintendo beat-'em-ups.

In March this year Clive Double joined the team as graphic artist and co-designer, followed by Adam Toon from the demo group High Risc.

The music was produced by Chris Dawson – formerly of the Datastream PD Library – with the front cover artwork designed by Mark Drakeford, who also designed the artwork for Ixion.

Incidentally, the original hand-painted artwork for Ixion disappeared after the Acorn User Show. Software 42 are very anxious to recover it and are offering a reward for its recovery.

Raw Power is basically a beat-'em-up for one or two players featuring 256 colour graphics and digitally sampled sound. The game runs at 50 frames per second even on an ARM2 machine.

Your opposition includes the usual array of bad guys as well as some massive fighting machines. Raw Power costs £25 and further details can be obtained from: Software 42, 109 Ferry Road, Hullbridge, Essex SS5 6EL.

DESKTOP VIDEO

ON THE MENU TODAY...

Wild Vision

Info

High quality expansions for the Archimedes, A5000 and A3000 from the specialists in Desk Top Video.

Real Time Colour Video Digitisers

Use video or TV as a source for computer images. The popular Hawk V9 digitiser is the ideal solution wherever you need photograph-like sprites in colour or monochrome for DTP or Art applications. Wild Vision combine quality and performance with value; real-time colour digitisers available from £199.00.

Superimposing text, graphics or animation onto video

Simple, with a *genlock and overlay card*. The Chroma range is your route to creating and recording video masterpieces. Just let the film - and your imagination - roll! Chroma Genlock range from £215.00.

PAL encoding units with optional multiple display facility also available.

Data acquisition

The Archimedes is the ideal vehicle for the measurement and analysis of analogue signals such as sound or ECG readings. Wild Vision's high speed 12-bit analogue to digital converters are used in medicine, research, defence, and incorporated into turnkey systems. ADC1208 from £560.00.

Image Processing

Image Processing and Analysis

The Hawk V12 video framestores are designed specifically for image processing on the mighty Archimedes. With Foster Findlay's ArcImage software, a powerful image processing and analysis system is created. Hawk V12 from £1,990.00.

A3000 Expansion

Expanded capacity for your A3000

Wild Vision's sturdy Expansion Box allows you to use standard Archimedes expansion cards with your A3000; up to three cards may be fitted at once. A3000 Expansion Box £139.00.

Misc

Contact Wild Vision for full details and price information on the above hardware and recommended complementary software.

Quit

Wild Vision, 15 Witney Way, Boldon Business Park, Boldon Colliery, Tyne & Wear NE35 9PE, Tel: 091 519 1455, Fax: 091 519 1929

Prices exclude carriage and VAT

WILD VISION

Song for the future

AFTER reading Jonathan Porrit's book, Where on Earth Are We Going?, Rilla Paterson from Rickmansworth was inspired to write a musical called Child of the Future with eight songs ranging from rock 'n' roll to ragtime which she is now making available to schools

The musical, which lasts just over an hour, is aimed at children of junior school age. The songs are catchy with the script giving opportunities for project work on a variety of topics.

Rilla Paterson used a Archimedes and Clares' Rhapsody to compose the music and all the data is supplied on one 3.5in disk.

The orchestral parts are graded for children of different abilities. For instance the easy violin and cello parts are all on open strings.

Copies of the musical have been sent to Kenya, Malawi, Nigeria, Zambia and Indonesia. You can buy a cassette of the score for £5 featuring the voices of 20 children from Little Green School, Croxley Green, singing against a synthesised accompaniment, with the accompaniment only on side B.

Further details from Rilla Paterson, 21 Rousebarn Lane, Croxley Green, Rickmansworth, Herts WD3 3RL.

Rounded system

THE A3010 Home Professional System, a limited offer package from Beebug (0727 40303) consists of the A3010 Family Solution plus a ram upgrade to 2Mb, an internal 20Mb hard drive, colour monitor on the hardware side plus a professional mix of software with Ovation, Typestudio, Pipedream 3, Artisan II, while a little light relief comes with Chess from David Pilling and Clares' superb flight simulator, Interdictor.

Retailing for £765, the offer ends on 31 January. All the software will be installed on the hard disk for you and if you prefer you could opt for 4Mb of ram or a 60Mb hard drive for £85. Prices don't include VAT but look out for the school supplement. When you buy one of these systems a £20 cheque is sent to a school you nominate.

Sound engineering practice

Musically inclined readers might like to take a look at EMR's (0702 335747) Sound Engineer package which is now available priced at £59.

Sound Engineer works under Risc OS 2 or 3 and lets you edit instantly any sample regardless of size. The samples could be ones you have created via commercial sampler hardware – such as that supplied by EMR and Oak – or be pre-recorded samples such as those available in the public domain.

Any sample rate can be used, re-pitched and played via the control panel, keyboard or external midi instrument. You can try out a huge set of processing controls in real-time as the sample is played as well as adding the kind of sound effects used by professional musicians.

Some of the features included are threshold recording, auto-looping, 3D FFT printouts, direct disk playback, harmonic wave generation plus spectrum analyser, oscilloscope and amplitude simultaneous displays.

Smart art

SMART DTP have compiled a special Christmas disk featuring clipart and sample files from their resources, borders and clip art collections. This catalogue disk can be obtained free with end purchases before January 1 1993.

Smart have also expanded their range of services, now offering high quality – 600 x 600 dpi – laser printing and scanning up to resolutions of 400 dpi. For more information contact Smart DTP at 36, Park Road, Duffield, Belper DE56 4GR.

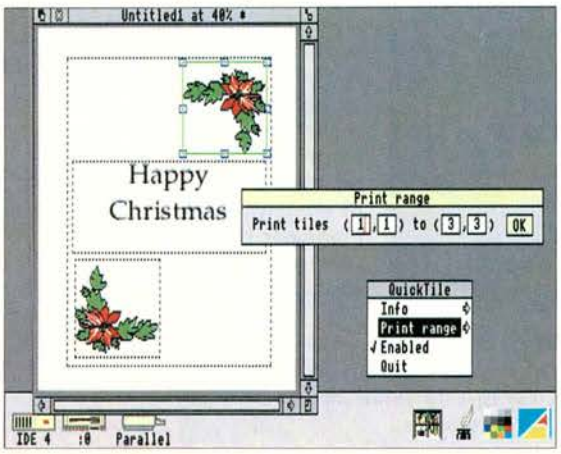
Making a big impression

EVERY now and again you'll find you need to make a poster, whether for a car boot sale, jumble sale or whatever. There are various tools on the market to help but for £25 you can buy QuickTile from Desktop Projects (061-474 0778) or £15 if you want to update your existing Tiler software.

Even if you only have an A4 printer you can now print documents larger than A4 by splitting the document into sections or tiles hence the name QuickTile.

Each tile is printed out with crop marks provided so that you can trim along the crop marks and piece the tiles together.

QuickTile creates posters from any Risc OS applications using Risc OS printer drivers, such as Draw, Paint, Impression, Ovation, ArtWorks, Squirrel, Pipedream and so on. So you can create your masterpiece in your favourite package and then use QuickTile to produce the size of poster you need.



Expanding hardware

ARXE Systems (081-534 1198) now have an extra marketing scheme going under the title of the Incremental Interface Range. These are hardware expansion cards for the 32-bit range whose major selling point is that you can take a basic expansion card and build on it extra features via a simple upgrade fitted by Arxe.

For instance, the basic Alpha High Density comprises a 2Mb high density floppy disk drive, an expansion card which takes up an expansion slot on the A3000, 400 and 540 and also the software you need to read and write 800k and 1.6Mb disks as well as standard and high density MSDos disks.

The card can be used with dual 3.5in and 5.25in drives and there is an option of using a 4Mb drive, but as both drives and disks are expensive at present the software will be held in abeyance until the hardware comes down in price.

The next stage is the Alpha Dual with 16-bit SCSI facilities on the same card – a definite plus point for anyone with limited expansion slots. Arxe Systems inform us that the 16-bit SCSI in compatible with CD-Rom drives, magneto-optical drives, flopticals and removable media such as Syquests.

The card works with Risc OS 2 machines although Risc OS 3 is recommended.

The price starts at £159 for an Alpha High Density interface or £100 if you don't need the floppy disk drive itself.

Fervour demo

A FEW people with 1Mb 32-bit machines have been experiencing a problem running the Fervour levels from the December Megadisk. If this applies to you please return your original cover disk to: *Acorn Computing, Europa House, Adlington Park, Macclesfield SK10 4NP.*

We now have a copy of these levels which will work on all possible configurations. The full version runs on the entire 32-bit range.

Cumana go for Sony technology

CUMANA (0483 503121) and Sony Components and Peripherals have reached an agreement to incorporate Sony technology into the manufacture of its new range of enhanced performance CD-Rom drives.

The first of these is the Cumana 500 series with further products under development from single units costing under £300 to complex multiple CD-Rom towers priced at £20,000.

Cumana MD John Simnett said: "Cumana's ability to harness the Sony advances in CD-Rom technology has enabled it to manufacture an outstanding range of powerful purpose-made CD-Rom products to suit a wide range of requirements."

Monitor upgrade

COMPUTER monitor specialist Microvitec (0274 390011) are promoting their Cub 3000 monitor as an alternative for anyone with an A3010, A3020 or A4000.

All Cub 3000 monitors are now supplied with a small jack plug to facilitate connection with the Acorn range. Should you have a Cub 3000 without one of these plugs and want to connect to the new 32-bit range then Microvitec's advice is to contact them directly.

The Cub range is housed in a rugged metal casing – aimed to withstand classroom use – with the highest levels of electrical and magnetic radiation safety and retails for £230.

In addition, Microvitec's 20in auto-scanning Auto-Scan 2038 is also compatible with the new range without modification. The RRP of £1,499 gives you access to a 15-38KHz horizontal scan rate and 45-120Hz vertical refresh rate.

Say it with clip art

DESKTOP Projects (061-474 0778) have released a new TopicArt disk of clip art just in time for the holiday festivities. Priced at £20, Christmas TopicArt comes on four compressed disks containing 155 drawfiles of Christmas cards, decorations, scenes, food and drink and much, much more.

Authorised Education Dealers

47 Winchester Road, Four Marks, Alton, GU34 5HG, Hampshire

All prices exclude VAT

0420 561111

Alsystems

EDUCATION AND TRAINING MICROCOMPUTER SYSTEMS

IBM Canon SJ RESEARCH

SPECIAL OFFERS

NEW ACORN COMPUTERS NOW BEING DEMONSTRATED !

RISCOS 3 now available £49 inc VAT

A5000/400/300 SCSI Hard Discs

SCSI Interface	£139.00
SCSI High Performance	£185.00
85Mb SCSI Hard Drive	£229.00
120Mb SCSI Hard Drive	£299.00
200Mb SCSI Hard Drive	£525.00

A5000 IDE Hard Disc Upgrades

40Mb IDE Hard Drive	£159.00
85Mb IDE Hard Drive	£199.00
120Mb IDE Hard Drive	£249.00
200Mb IDE Hard Drive	£425.00

Miscellaneous Drives

44Mb External Cartridge Drive	£375.00
88Mb External Cartridge Drive	£599.00
Cumana External CDROM Drive	£399.00
A3000 60Mb HardCard - Internal	£349.00
A3000 80Mb HardCard - Internal	£435.00

Limited Special Offers...Teachers Scheme

Acorn A5000 LC/40 - £1380 inc VAT, Acorn A5000 LC/120 - £1495 inc VAT

Acorn Premier Dealer - UNIX - Network Specialists - Repairs and Maintenance

Expressive Software Projects

Music Programs For Acorn's Archimedes Range Of Computers

COMPOSE WORLD

In Compose World short phrases of music are represented as pictures or words and these musical building blocks can be used in any combination, and in any order, to compose a tune of up to eight parts.

Phrases can be created and edited in the built-in musical grid editor which features extensive facilities such as :- transpose, change volume, stretch, invert, reverse as well as the standard cut and paste facilities.
Pictures can be drawn with the simple built-in painting editor.
Full support for Archimedes Sprite files, MIDI files and Maestro files provides easy links to other art and music programs.
Simple cartoons can be created by linking phrases to larger Sprites which are displayed while the sequence is being played.
The effect of chosing different sounds can be explored either through the Archimedes' own sound system or by using a MIDI keyboard.

Compose World: £48.00 + VAT (£56.40 inc VAT)

RHYTHM MAKER

Rhythm Maker provides exciting opportunities to explore and create rhythm patterns. These rhythms are edited using a time grid with full control over volume and stereo position. The patterns can be different lengths using a variety of time signatures and a wide range of grid resolutions.
The range of instruments used to create the rhythms can be chosen from a large selection of Archimedes internal and MIDI sounds.
The rhythm patterns can be sequenced in any order and combination to make a complete rhythm track.
This program is a powerful compositional tool and is designed encourage exploration of the effect of different rhythmic variations.

Rhythm Maker: £34.00 + VAT (£39.95 inc VAT)

COMPOSE WORLD Files 1

Compose World Files 1 is a collection of twenty-eight extra files for use with Compose World. The disc contains files which cover a wide variety of different musical styles and structures as well as files which make use of the picture display facility of Compose World.
Some of the files also make use of the sounds provided with VoicePack1.

Compose World Files 1: £12.00 + VAT (£14.10 inc VAT)

VOICE PACK 1

VoicePack1 contains fifty-four sound modules for use with Archimedes music programs like Compose World and Rhythm Maker. An application called !ClickVox is provided with the disc which enables you to load or remove sounds from the sound system and save the settings to make it easy to configure the system for your own needs.

VoicePack1: £15.00 + VAT (£17.63 inc VAT)

FLEXI synth

Flexisynth provides facilities to explore and create new sounds on an Archimedes.
Using analogue style synthesiser techniques sounds can be created from waveforms, volume envelopes and pitch envelopes with control over modulation, tremelo and vibrato. With the large bank of waveforms provided and the extensive control facilities a vast range of different sound timbres can be explored.

The program is designed to be easy to use with the opportunity to configure the screen and available options to make the program accessible over a wide range of ages and abilities.
The sounds created can be saved as Archimedes sound modules and used with any Archimedes music program.

Flexisynth: £34.00 + VAT (£39.95 inc VAT)

ESP

Holly Tree Cottage
Main Street
Strelley Village
Nottingham
NG8 6PD
England
(0602) 295019

UK Postage & packing £1.50 + VAT (£1.76 inc VAT).

Send for a free catalogue.

The New Generation!

RISC user

RISC User, the highly popular magazine for Archimedes users, is bigger and better. The new RISC User is now B5 size which offers a sophisticated design, bigger colour illustrations and bigger pages with more information. Altogether better value and no increase in price.

RISC User is still a convenient size to assemble into an easy-to-use reference library, containing all the information you need as an Archimedes user. Every issue of RISC User offers a wealth of articles and programs with professionally written reviews, lively news, help and advice for beginners and experienced users, and items of home entertainment. Altogether RISC User has established a reputation for accurate, objective and informed articles of real practical use to all users of Acorn's range of RISC computers.

RISC User Disc The RISC User magazine disc is widely acclaimed as the best magazine disc available for Acorn computers. Each disc is packed with original software of the highest quality, fully tested and supported by our own staff plus all the programs from the magazine.

Discounts RISC Developments is also well known for its range of professional software and hardware. As a RISC User subscriber you will receive at least 15% off any RISC Developments' software and 5% off RISC Developments' hardware, and this list of products is constantly growing.

A year's subscription to RISC User is £19.90 for the first year and only £18.40 for a renewal. (Overseas: £29 Europe, £38 Americas and Africa, £41 Elsewhere).

THE BEST PROGRAM AND TEXT EDITOR FOR THE ARC HAS JUST GOT A LOT BETTER

NEW

DeskEdit2

A major new release of the popular and powerful editor DeskEdit brings a whole toolkit of features that will assist all programmers, whether novice or experienced, and whether using Basic or C - and all within Acorn's powerful multi-tasking RISC OS Desktop. There is a lot for text users too.

All this of course is in addition to the features that have made DeskEdit so popular among users of Acorn machines, and which resulted in glowing reviews when it was first launched a year ago. IN FACT DESKEDIT IS SO GOOD THAT IT IS USED WITHIN ACORN ITSELF!

New features include:

- **Basic program Renumber** - including partial renumber and marked sections.
- **Basic Program Indenter** - indents Basic programs after IF THEN, REPEAT, FOR etc.
- **Basic Abbreviations** - all Basic V's several hundred abbreviations are implemented).
- **Programmer's Calculator** - a powerful calculator especially designed for handling bits and bytes.
- **Multi-purpose Browsers** - an easy to use browser window containing a list of finds. Clicking on any one of these will take you to the corresponding place in your file.
- **Throwback** is fully implemented so DeskEdit can respond to messages from C compilers etc.
- **!FIND** - DeskEdit comes with a powerful stand-alone Acorn application called *Find*, which can find text strings in a whole group of files, just given a wildcarded filename.
- **Extended Saves** - DeskEdit 2 can save a special data file with the position of the caret, wordwrap correctly set and markers

DeskEdit 2 (disc, new manual, keystri and quick reference card) PDE2b £31.95 inc + £2 p&p
DeskEdit 2 Upgrade Code PDEXa £9.95 inc + £2

NEW

Wimp Programming for All on Acorn RISC Computers

book by Lee Calcraft and Alan Wrigley

This new book provides programmers with a complete introduction to all the techniques involved in writing multi-tasking Wimp programs to run within the RISC OS Desktop environment. No prior knowledge of the Wimp is assumed and the tutorial style of the book will enable all programmers to understand the concepts involved and to develop their skills in writing high quality programs within the Desktop environment.

The book consists of ten main chapters and a number of appendices:

- Chapter 1: Introducing the Wimp
- Chapter 2: Windows
- Chapter 3: The Wimp Poll Loop
- Chapter 4: Error Handling
- Chapter 5: Icons
- Chapter 6: Menus
- Chapter 7: Redrawing Windows
- Chapter 8: The Wimp Message System, Loading and Saving Data
- Chapter 9: Templates
- Chapter 10: Printer Drivers and Outline Fonts

- Appendix A: Indirection Operators
- Appendix B: Application Resources
- Appendix C: Setting up a sprite area
- Appendix D: The Wimp Programmer's Toolkit
- Appendix E: SWI calls described in this book

We believe that Wimp Programming for All will prove to be the definitive book on this subject for all users of Acorn RISC computers.

To support the book there will is a **disc** containing all the programs as listed within the book, together with additional supporting applications.

Wimp Programming for All book	**Code BK12**	**£12.95 inc + £2 p&p**
Wimp Programming for All disc	Code BK13	£4.95 inc + £1 p&p

RISC Developments Ltd. 117 Hatfield Road, St Albans, Herts AL1 4JS. Tel. 0727 40303 Fax 0727 860263

Tasty graphics

CHRISTOPHER Kecun has just started his own clip art company specialising in both sprite and drawfiles. Created on an A5000 using Revelation Image Pro they are some of the most unique graphics available commercially on the Archimedes.

Further information from: Christopher Kecun, 1 Japan Street, Cheetham, Manchester M8 7H.

Keeping note

FILE-a-Disk is a new product from MD Office Supplies (0689 861400). A colour coded disk filing system for £12.95 for 3.5in disks, File-a-Disk contains an A5 wipeclean 4-ring binder, instructions, address and telephone record section, essential hardware and software record and four indexed colour codes section each containing disk labels, contents sheets and note pages.

The system gives you the ability to keep records, on hardware and software, such as serial numbers, suppliers, maintenance contracts and emergency telephone numbers.

Dream winners

FROM the many many entries in the Guile competition on the October cover disk, our special congratulations go to 10 people whose guile surpassed that of the programmers.

Overall winner was Kevin Murphey with a score 14,400 followed by William Moffatt and John Chadwick both with 13,900. William's comment was: "What keeps you coming back is that your own mistakes lead to your downfall, not some whim of the computer".

The other high flyers were, in order of score: Julian Hatton, Adam Morgan, Robert and Gerald Pfeifer, David Bilsby, Michael Huxley, Andrew Simpson and Robert Bathgate.

Bett '93 aiming for Olympia

HERALDED as Britain's premier showcase for education, this year's show will take place at the National Hall, Olympia in London between January 20 and 23. It is organised by EMAP (071-404 4844).

This is the eleventh annual show, and BETT's emphasis as always is on ideas, information and advice covering all subject areas and levels of education. There are more than 250 leading suppliers of educational IT and related resources as well as a number of dedicated sections – The Acorn Village, the Software Village, the IT Book Village and the Associations Centre.

The Acorn Village will be featuring over 30 software and hardware companies such as Computer Concepts demonstrating their ColourCard range, 4Mation with the 32-bit version of Granny's Garden and Chatter, a simple low cost communications program supporting most of the common protocols and ideal for beginners.

Also on show will be the new version of Vector and an expanded Snippet including a variety of fill effects and a full screen magnifier.

Oak Solutions will be demonstrating their Design Processor consisting of a large database of information together with a number of tools to manipulate it.

Risc Developments will be present with hardware including hard drives, IDE boards and their Spectra colour scanner, while supporting the software side with the multitasking Masterfile 3 and PlayBack among others.

Digital Services will be launching their new network program, Netgain – a program server which allows programs to be loaded over standard Econet networks at the same speed as a local hard disk.

Clares will also be present with a host of products from Rhapsody 3 to NightSky and Schema 2.

In addition the show includes the launch of the Micros for Special Needs Area designed to illustrate how IT can enhance the learning opportunities of people with communication difficulties and/or physical impairment and is being organised by NW Semerc.

There will also be a comprehensive seminar programme running over the four days to suit many levels of technical understanding.

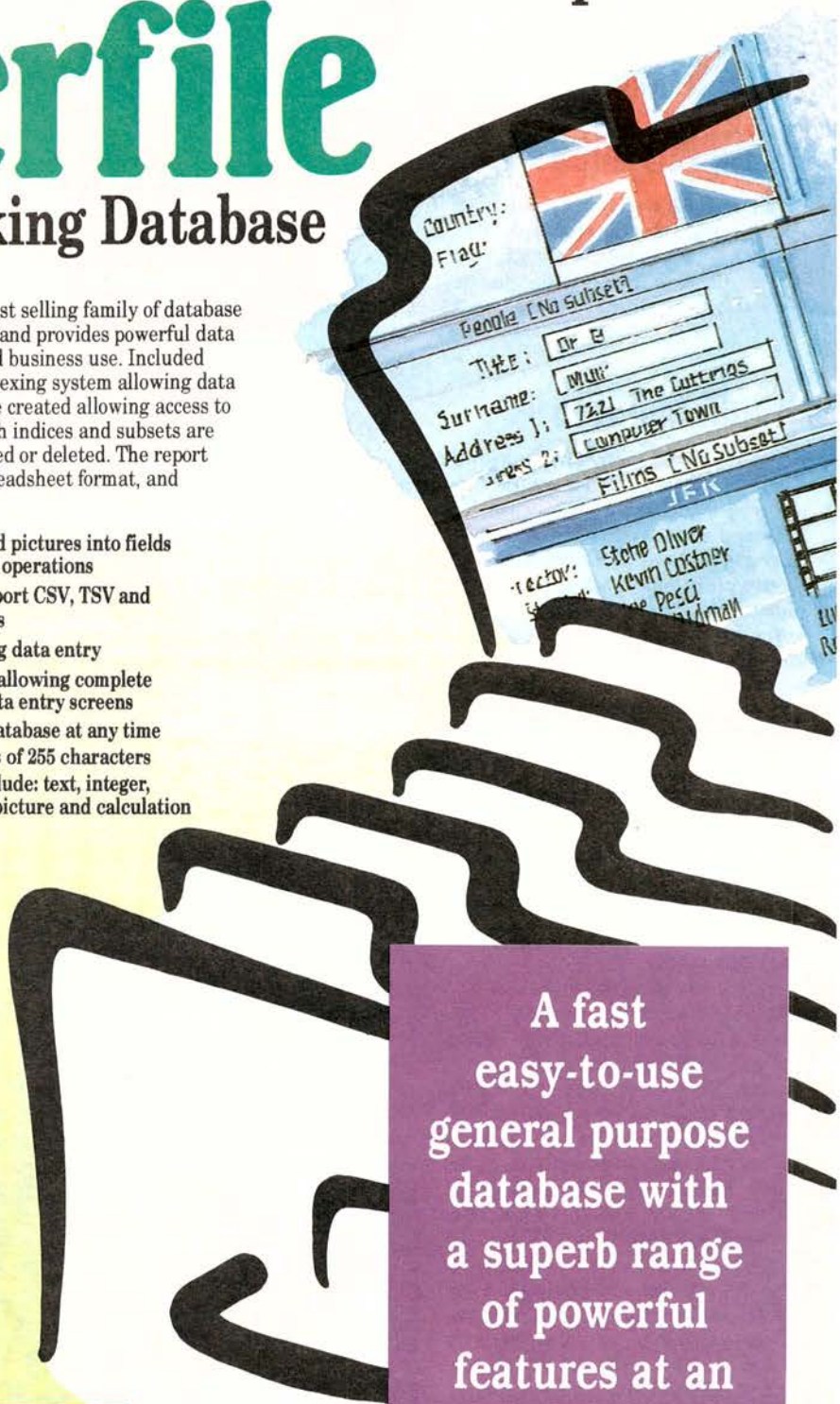
The Outstanding New Database!

VERSION 3

For all Acorn 32-bit RISC computers

Masterfile

Powerful Multi-tasking Database



Masterfile version 3 is the latest development in the best selling family of database programs for Acorn computers. It is fast, simple to use and provides powerful data management facilities suitable for home, education and business use. Included amongst its many features is a very comprehensive indexing system allowing data to be accessed in any order. In addition, subsets may be created allowing access to just those records which match the search criteria. Both indices and subsets are updated automatically when records are added, modified or deleted. The report generator allows databases to be printed in card or spreadsheet format, and provides full label printing facilities.

- Fast,multi-field indexing
- Multiple subsets
- Password protection for data security
- Global calculations across all or part of the database
- Multi-line fields
- Optional toolbox with buttons to step through records
- Calculation fields based on values in other fields
- Import text and pictures into fields by simple drag operations
- Import and export CSV, TSV and ASCII data files
- Range checking data entry
- Card designer allowing complete freedom for data entry screens
- Re-structure database at any time
- Up to 255 fields of 255 characters
- Field types include: text, integer, decimal, date, picture and calculation

Supplied with sample databases, and a user guide containing a step-by-step tutorial and reference section describing all the facilities provided.

Price **£49**
plus VAT

Available from all good dealers or direct from RISC Developments
(please add £2 carriage)

A fast easy-to-use general purpose database with a superb range of powerful features at an affordable price

RISC developments

RISC Developments Ltd.
117 Hatfield Road, St. Albans, Herts. AL1 4JS
Tel: (0727) 40303 Fax: (0727) 860263

Masterfile in Education
Masterfile 3 has been designed in conjunction with IT advisors and is available at a special educational price. A site licence for 30 users is available priced £245. Please phone for further details.

SUBSCRIPTION SPECIAL
Four great programs on your disk this month

If only pigs could fly!

Mazoink: Porker mayhem

SILLY game scenario number 17,432,527: You have been transformed into a pig and planted in a set of seven mazes by somebody evil. You must escape by locating the exits.

Unfortunately things aren't quite that simple – are they ever? – you also have to contend with lots of monsters out to get you. So you need some fast and effective means of getting Piggy to do what you want, so you need the Piggy Guidance System.

The *PGS* is composed of the following functions:

Z	Left
X	Right
"	Up
?	Down

You can use Q and S to turn the sound on and off respectively.

The game features large animated sprites for the characters, a permanent high score table plus seven levels of increasing complexity. In fact, as soon as you start the game a puzzle will confront you – don't give up – that's designed as an introduction to the methods of gameplay involved.

The scoring system consists of 20 points per grey block that you walk through, and a bonus for every level completed.

This bonus is calculated as 1,000 points multiplied by the level completed.

Here are some hints to help you through:

- You can walk through grey blocks and the monsters can't – make sure you don't leave yourself open to attack for the sake of a few points.
- Monsters which are in the way, have to be tempted to move – get them to chase you, then lose them.
- If an exit seems difficult to reach there may be another hidden elsewhere.

Good luck and may the Oink be with you.

Ben Currie

ScroLand: Into the realms of the moving scenery

HANDS up those of you who knows an Amiga owner. Keep your hands up if they laugh at the lack of games and demos. Yes, too many hands. Well, the Arc is fighting back: A magazine demo with four layers of parallax, a parallax scrolling landscape and a scroll-text – all in under 7k. Beat that on your 16-bit.

The demo has to be contender for *Succinct Program of the Year* – using just one screen bank (80k) and 64k for the Basic program and variables. Despite the low memory requirements, the processor is working overtime – it could quite possibly have *ARM-ache* afterwards.

Parallax is the current fashion in demos. It basically means that you have several layers (or levels) of scenery, stars or whatever, all scrolling around the screen at different rates. This can give the impression of movement – nearer objects moving faster than distant ones. In a starfield, the parallax can be enhanced by dimming the stars as they get farther away.

There are several different methods of plotting parallax – some of which are too complicated to go into here. The two used here are quite simple. For the stars, all that's needed is a table with an entry for each star. An entry consists of the x and y coordinates, the colour and speed of movement.

A section of code goes through the table, calculating screen addresses and plotting a pixel of the given colour at that address. After plotting, the x coordinate is decremented by the speed, negatives are caught and sent back to the other side of the screen. This creates a continual field of stars, moving at different speeds.

The landscape uses a different technique. The left half must be a mirror image of the right, and is drawn first by a Basic procedure. A machine code routine is then used to scroll it – the top is scrolled at eight pixels per frame, the bottom is scrolled at half that. This creates the parallax.

The scrolling text is the most difficult part of the entire demo. Initially OS_WriteC (equivalent to VDU) was tried but this was far too slow. Instead the definition of each character is extracted using OS_Word 10, and then converted to a small machine code program.

Each separate code fragment draws a different character on the screen. This speeds things up tremendously, and it's simply a matter of adding the ripples by changing the y position of each character.

Anyone who knows the basics of ARM programming can write a demo. The easiest way to start off is by just doing a little. Just try a star field at first, perhaps. Don't worry if it doesn't work, programs hardly ever do first time around. If you persevere, almost anything can be achieved. The best part of writing a program is seeing it working at the end.

Paul Mason

● *It's easy to create this demo*

32 bit reviews index...all the best

THE *Acorn Computing* subscription disk contains an up-to-date list of all the products for the Acorn 32-bit micros that have been reviewed in *The Micro User* and *Acorn Computing*.

The reviews index is a text file and you can approach it in various ways. Using the Search facilities available in Edit you can look for a specific product, a company or a date. But more importantly the index has been split into subject headings so you can choose, say, business and see what products are available.

Stephen Wade

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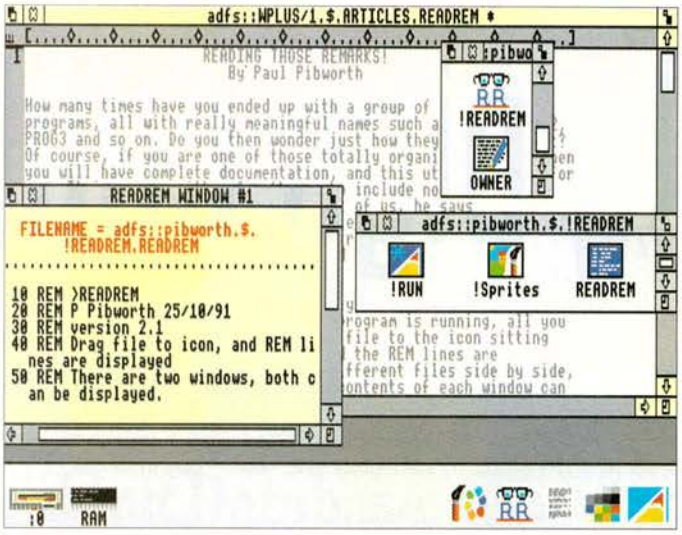
If any details for your products are incorrect please inform us by post or fax so that we can put them right.

Reading those remarks

HOW many times have you ended up with a group of half finished programs, all with really meaningful names like PROG1, PROG2, PROG3 and so on. Do you then wonder just how they are different? Of course, if you are one of those totally organised people you'll have complete documentation, so this utility is not for you.

It is no use either for those who include no REM lines at all in their programs. However, most of us use them, at least at the beginning of our programs. We find them useful for recording such things as the date, the author, the version, and of course, what the program actually does.



● *Easy examination of Basic programs*

This program lets you look at the initial REM lines in any Basic program. Once the program is running, all you have to do is use the mouse to drag a file to the icon sitting quietly on the bar. A window opens and the REM lines are displayed.

You can even look at two different files side by side, each having its own window. The contents of each window can be printed, using either side of the page to save on paper. If you drag any other than a Basic file, you will see an error window to remind you of the error of your ways.

The program uses two windows which are almost identical, labelled ReadRem #1 and ReadRem #2 respectively. I have not followed the convention which uses the full pathname because the width of the window is restricted and too narrow for a long pathname and the name is in the window anyway.

You can drag a Basic file on to the iconbar and the program scans it to read the REM statements then displays a window with the information. You can now drag the file either into a window or on to the iconbar and the information is displayed in alternate windows.

Each window is opened already scrolled to the right. This is because the first lines are usually numbered 10,20,30 and so have three leading spaces. If you click the Menu button when in a window, a very simple menu is displayed, giving a choice of Print LHS or Print RHS.

If you now click Select, you will send a copy to a printer – as text no printer driver is needed as long as your printer is Epson-compatible. The LHS and RHS refer to which side of the paper you wish to print on. This is both an environmental issue, and a point of convenience, as each printout is limited to 38 characters width.

Printing involves no printer codes, there is no need for a printer driver. The only assumption is that a printer is connected and turned on. There's no *save* option – not really needed for REM lines.

Paul Pibworth

Escher Sound: The stairway to heaven never gets there

M. C. ESCHER was a Dutch lithographer who died in the early 70s. He was well known for his explorations of pattern and perspective, and in fact he even produced fractal patterns long before fractals were invented.

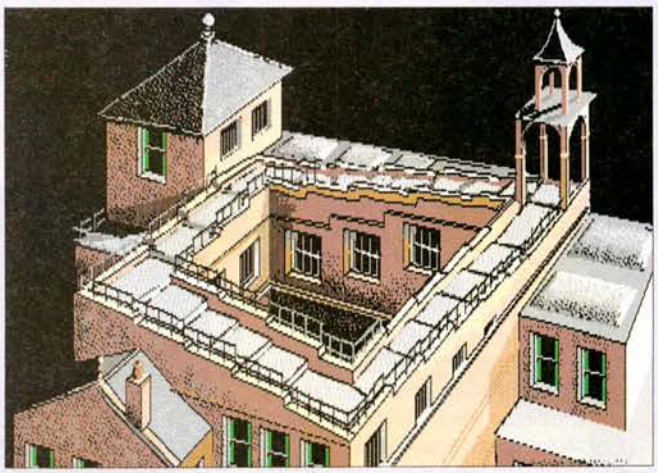
One of his most famous works is *Ascending and Descending* produced in 1960. Here a line of men march round a staircase forever going up while an other line forever goes down.

What these illustrate is how the mind can be tricked into seeing something it knows can't exist. While optical illusions are well know, audio illusions are much rarer.

Escher Sound is an audio version of the ascending staircase: It's a sequence of notes that gets forever higher and yet never changes – with the sound capability of the Acorn 32-bit machines this can be easily achieved. If you don't want to know how it works read no further.

The trick lies in the harmonic content of the notes. Any musical sound consists of a number of tones the frequencies of which are related to each other. The fundamental or lowest frequency is accompanied by a tone at twice the frequency, the second harmonic, three times, third harmonic, and so on.

The relative volume of these harmonics makes notes sound distinctive. To achieve our audio illusion we need six harmonics with the high and low ones being quiet and the middle ones loud. What we do is have a fixed harmonic envelope, that is the strength of a harmonic is determined by its frequency.



● *The sound rise and fall into infinity*

Then for successive notes we shift all the harmonics up a bit. As our note sequence increases the highest harmonic drops off the end and a new lower harmonic is introduced. However, the ear detects a general increase in the harmonics and so is fooled into thinking that the new note is higher than the previous one.

I hope you have fun with this little illusion.

Mike Cook

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This month's exclusive, subscriber-only package contains a great game and three utilities.

In Push the Bale you must move all the bales of coton into their proper positions – it's easy at first but there are 50 screens.

Piano man is a great demo that shows how good the music can be on the Beeb.

With Telephone Mania you have to keep your wits about you as you handle a busy telephone exchange.

And finally there's a utility that will print almost any calendar.

Pick a bale of cotton

Push the Bale: Down on the farm

YOU are a worker in a warehouse which stores bales of cotton. You have to manoeuvre the bales on to the white dotted marked storage areas by pushing them round the warehouse, but you are only strong enough to push one bale at a time. There are 50 screens to complete.

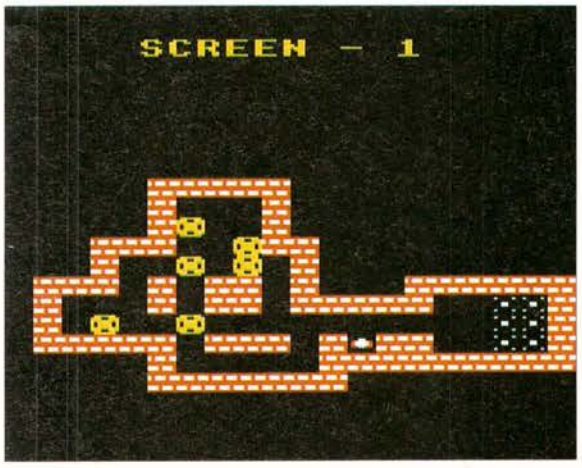
When you have finished one screen the program will automatically go on to the next, but at any time a new screen number can be selected, in any order.

The following keys are used to control the man:

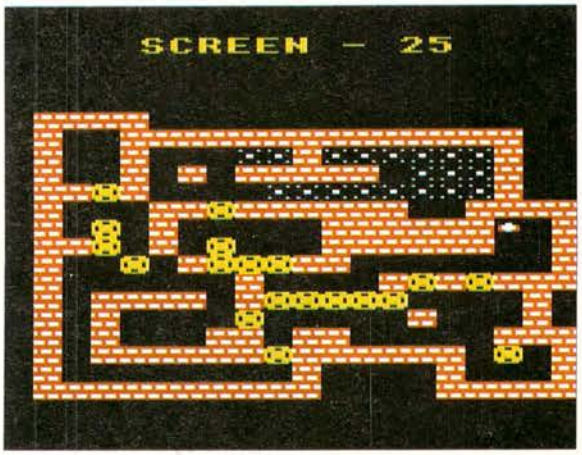
Z	Left
X	Right
:	Up
/	Down
Delete	Backstep last move
Escape	Resets the present screen
Shift+Escape	Exits the program
N	Enables you to change to one of 50 other screens
Q	Completely quits the game

You may sometimes think that a particular screen can't be finished but with perseverance and some lateral thinking all 50 screens can be completed.

Carl Wheat



● *Getting started on Level 1*



● *It gets a lot harder*

Piano man: A tinkle on the ivories

JUST sit back and relax with this great demo which shows how good both the sound and graphics of the old 8-bit machines can be.

Mike Goldberg

SUBSCRIPTION SPECIAL
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Telephone mania: Ring my bell

TIRED of games that have a familiar ring to them? Need something that gives you that extra buzz? Telephone Mania will soon have you playing in a different tone.

You have been put in charge of a manual switchboard for a day. As telephones light up you must link them together.

When linked they disappear, only to be replaced by another pair. Sounds easy, but if you take too long connecting one pair more will appear and you have to connect the right ones together.

If you connect the wrong phones or connect a phone to an empty space you lose a life but there's a time limit to each level as well so you've got to get it right, pretty quickly.

You start on a simple 4x4 switch but on each level it gets bigger and more complicated, more phones to connect, less time to do it in and they come in faster.

To make things easier many of the real problems that telephone operators have – irate callers, reverse charges, 999 calls and so on – have been ignored.

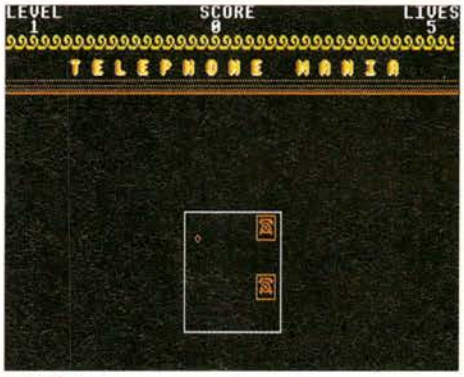
To move your indicator light around the switchboard use the standard keys:

Z	Left
X	Right
:	Up
/	Down
Space	Fix a phone line.

Is this game *just your call* or will you get disconnected permanently?

Josh Westbury

● *Take a look at those high scores*



● *This looks easy enough...*

...oh no, who's ringing who?

Calendar: Make a date – any time

OFTEN, when using a wordprocessor, spreadsheet or database, you may find you need to know, for example, the date of the last Monday in August, or on which day of the week the 4th July falls. Many calendar utilities have been published before but these have all been in Basic.

This means saving the data you are working on, entering Basic, running the calendar program, noting the information you require, restarting the application and reloading the work in hand. What a pain, especially for tape users.

This program, written entirely in machine code, will print the calendar for any month from Jan 1753 onwards, and can be run from disk or tape from almost any program that accepts * commands – the BBC Micro's nearest equivalent to multitasking.

Simply enter *CAL m(m)/yyyy, where m(m) is a one or two digit month number, and yyyy is a four digit year. For disk users the CAL utility should be in the library of your current disk and tape users should use */CAL m(m)/yyyy). The separator can be almost any character except a digit and any illegal date will exit with a *Bad Date* error.

The program uses a rather novel algorithm: Each century begins five days later than the previous one, plus one day for each leap century, which in 400 years amounts to 21 days, exactly three weeks. This means there are only four days on which a century can begin. The correct value is read from a lookup table.

To this is added one day per year, one day for every fourth year, and finally the number of days in the intervening months, stored as the number of days by which the month exceeds four weeks, so enabling the sum to fit into one byte.

```
1010,1C70,440,7EFC,4004,4004,600C,2008,2
008,27C8,3C78,0,EE0,FE0,FE0,FE0,FE0,X,AA
0,540,AA0,540,AA0,0,0,0,0,1550,AA0,1550,
280,11,15
 2140 DATA15,3FE,262,E02,7836,1CF74,10A1
4,14014,10A04,1CBE4,7804,E0C,218,230,26C
,3C0,0,0,0,0,1E0,1E0,1E0,X,80,108,0,208C
,400,10,0,40,120,C0,0,10,4
 2150 DATA16,1E07E,12043,138C1,10889,12F
81,1015F,70554,40144,40E56,4D002,7890A,8
542,C2A6,6002,3022,1FFE,0,0,0,0,0,0,0,0,
0,7000,7800,3C00,1C00,C00,0,8000,4000,1C
00,C000,11000,A000,0,0,1010,810,508,3,9
>*CAL 9/1991

SEP 1991

Su Mo Tu We Th Fr Sa
 1  2  3  4  5  6  7
 8  9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29 30

>
```

● *Find out the day, whatever your doing*

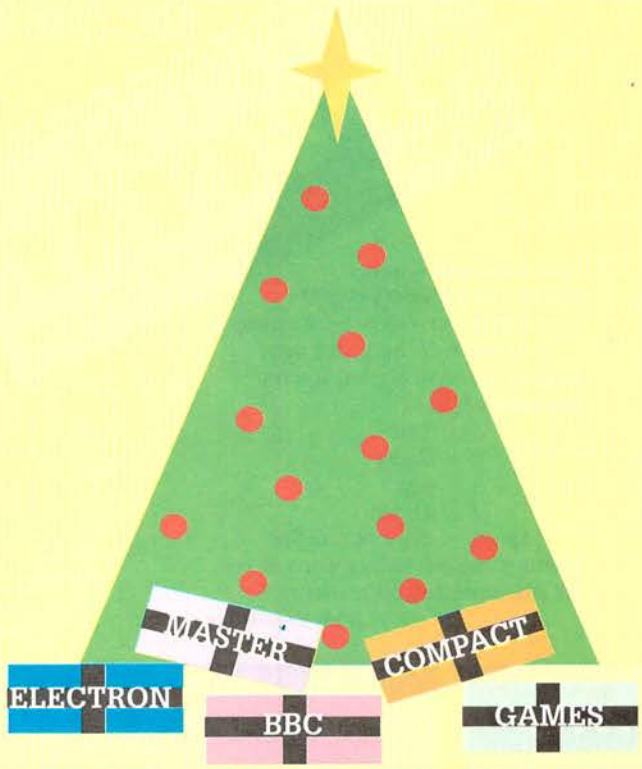
After correcting for non-leap centuries, the sum is divided by seven, the remainder giving the number of columns to skip to the first day of the month, which is then printed out in the usual seven columns.

The machine code occupies most of pages &9 and &A, and the only zero page locations used are those reserved for * commands. The program works fine from tape, but any open cassette files should be closed, since the data in the buffers will be corrupted.

I suggest that tape users should record multiple copies along one side of a C10 – a ten minute computer cassette, not a twin engined C5.

There is no upper limit set for the year, but some 2000 years hence the calendar will once again become out of sync with the earth. I shall not be here to worry about it.

Phil Bender



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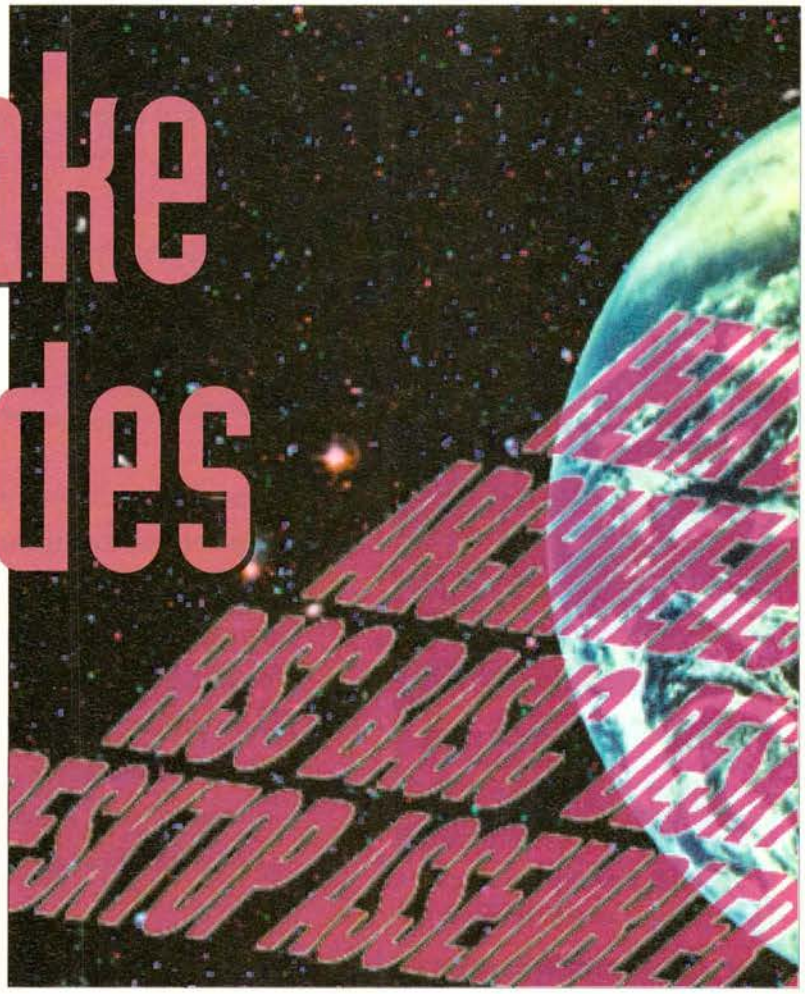

Steve Turnbull begins an analysis of the languages available for programming your Acorn 32-bit machine

THERE are two types of computer user, the ones who like using programs and those who like creating them – and it's lucky for the first group that the second group continues to exist.

In schools the emphasis used to be on how to *program* computers but now, thankfully, this silliness has passed and the computer is used as a tool.

But it's a tool with a difference: It can be used for a multitude of different purposes, depending only on the imagination of the designer, but you still need a programmer.

Once you get the idea that perhaps you'd like to create a program to make your computer do something the next question arises: How?

Computers respond to instructions given to them in their own machine language which differs depending on the type of *processor* that does all the hard work.

On PCs the processor is the Intel x86 series (286, 386 or 486), which are mostly compatible with each other. On Atari STs, Commodore Amigas and Apple Macs it's the Motorola 680x0 series (68000, 68010, 68020 and so on). Acorn used the 6502 processor for the 8-bit machines and its own ARM chip for the 32-bit computers.

Machine code is very difficult for humans to grasp, consisting as it does of numbers. Big computers used to have switch panels to allow you to input the numbers directly into an empty machine.

You can't get empty machines nowadays. The computers you can buy always come with a certain amount of machine code already built-in. In the case of most PCs, for example, there's a small amount of code which is enough to read information off a hard or floppy disk.

What this code does is load in the operating system. This is a large and complex piece of machine code that has overall control of the computer and provides routines for performing input and output.

On Acorn machines the whole of the operating system – called MOS on the early 8-bit machines and Risc OS on the new ones – is held in the machine at all times. This means you can just switch on the machine and start – no extra disk is required, apart from the System resources but they're not essential.

The next step up from pure machine code is Assembly language. This uses human-style words as symbols for the fundamental operations of the machine so if you wanted to add two numbers together you would use the word ADD in conjunction with some way of representing the numbers.

Assembly language requires an assembler program to convert the symbols into machine code – of course somebody has to write the assembler itself.

On Acorn's machines Assembly language programming has always been quite popular for three reasons: Both 6502 and ARM code are simple and easy to grasp – totally unlike the x86 and 680x0

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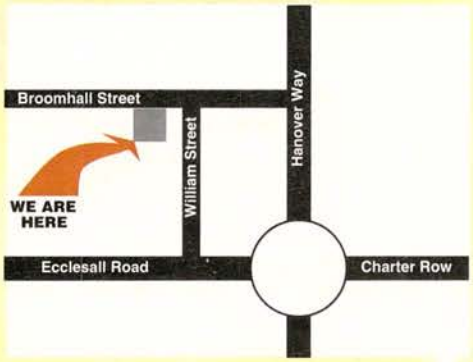

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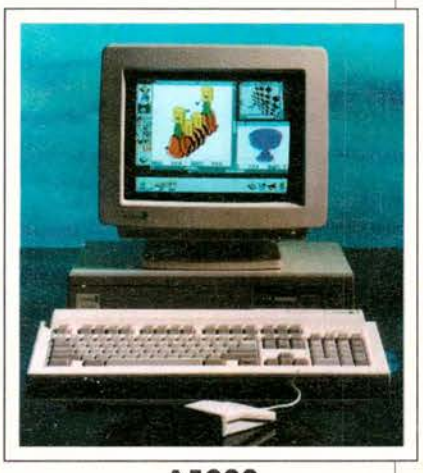

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BBC Basic

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THE original Basic language, developed in the early 60s, was designed to be easy to learn and is an interpreted language so that instant results were available. At that time the idea of structured programming – designing programs in independent blocks – had not really forced its way into the programming world so no provision was made for it.

The language became very popular but every organisation that used it modified it for their own purposes. This resulted in hundreds of different dialects all over the world.

When the micro revolution took place in the 1980s almost every computer manufacturer used Basic as the language for their computer – including Acorn.

But because Acorn were trying to fill the specification of the BBC they created a completely unique and powerful version of the language which included ideas that didn't exist in any other dialect: Procedures and multiple-line functions, parameters to procedures and functions, REPEAT..UNTIL loops, local variables and so on.

With the advent of the 32-bit machines Acorn went a stage further and added WHILE..ENDWHILE, CASE..WHEN..ENDCASE, multi-line IF..THEN..ELSE..ENDIF structures and numerous other commands including ones to give easy access to the operating system.

The result is a language that runs very fast and is perfectly suitable for creating multitasking applications to run in the Risc OS environment.

For the purist structured programming is catered for completely and there's no need whatsoever for a GOTO or GOSUB instruction although they are still available for compatibility with earlier programs.

Despite all the changes BBC Basic still maintains its friendliness and, with the advent of Risc OS 3, you can create and edit programs in the Desktop with the built-in Edit program.

One serious disadvantage and, in my opinion, a serious blunder on Acorn's part, is that the manual detailing all the commands has to be bought separately.

If the program is supplied, the documentation should also be. If you do get the manual it is fairly competent but lacks any real tutorial. But a number of third-party books could help such as *Basic V: A Dabhand Guide.*

➤

processor languages which are horrendously complex, Acorn have always supplied an assembler built-in to every computer and Acorn's operating systems have always been easy to hook into.

Many people who program for Acorn machines choose to use machine code simply because it is fast, easy and quite pleasurable – to programmers anyway. You'd be hard-pressed to find a similar situation on other computers.

Above Assembly language come the so-called high-level languages which are, theoretically at least, more understandable by humans. These must then be processed by another program so that the computer can perform the actions required.

There are essentially two methods of processing the instructions of a computer program: By *compiler* or by *interpreter*. The two are completely different. A compiler works by taking the high-level language program and converting the whole thing into the equivalent machine code instructions.

In fact compilation is usually a two-part process: The initial compilation converts the program to a file of almost-machine-code while in the second part there's a *linker* that takes a number of almost-machine-code files and links them together to form the final machine code program.

An interpreter never converts anything into machine code, it takes each instruction in turn and carries it out. BBC Basic in each Acorn machine is an interpreter which is why you can type an instruction:

```
PRINT 3 + 4
```

and get an instantaneous result. The interpreter simply does what it's told immediately. You can't do things like that with a compiler – you have to write complete programs.

However compilers are better than interpreters because the final machine code is much faster. If you have two identical programs written in BBC Basic, to add together all the numbers from 1 to 100,000 a compiled version would do the job much faster.

Why are there so many different computer languages? Apart from a natural evolution of ideas over the years, languages are developed to fill different needs. Basic was invented to be easy to learn, Fortran was designed for mathematicians, Cobol for business, Algol 68 was supposed to be all things to all programmers.

But there's a process of natural selection based partly on tradition – Fortran is still around because so much effort was put into it in its early days – and partly whether the language is genuinely useful. Pascal is excellent for teaching structured

➤

Desktop Assembler

Price: £119 (exc. VAT)
Supplier: Acorn Computers Ltd., Fulbourn Road, Cherry Hinton, Cambridge
Tel: 0223 254254

AS described in the opening section Assembly language is the machine code of the computer using symbols that are understandable by humans. Acorn's Desktop Assembler is a very sophisticated program with facilities that can help you create large applications successfully.

It comes with parts of the Acorn Developer's Desktop Environment (DDE) including the superb debugger which allows you to interrupt any program you're creating, as it runs, to see what it's doing and why it's going wrong. You can even examine the operation of multitasking programs.

You get two versions of the assembler: AAsm and ObjAsm. The first allows you to create machine code directly while the other takes an intermediate route requiring the use of a linker to create the final code.

Using ObjAsm you can mix your Assembly language with C as long as you conform to the ARM Procedure Call Standard as described in the manual. Plus you can utilise things like the Shared C Library to make it easier to write multitasking programs.

Both assemblers allow you to use the floating point instructions – to manipulate numbers that aren't whole numbers, like 3.401 – and these will work with either the floating point emulator or floating point co-processor chip if one is fitted.

In the standard Acorn slip-box you get three disks and two manuals. One manual covers the assembler itself while the other deals with the Desktop Developer's Environment.

programming techniques.

In the description of the programs that follows we're looking at what a program is best used for and whether it's actually any use at all on Acorn's machines – from the highly simplistic !Producer to the incredibly sophisticated SmallTalk-80.

We have sub-divided the languages into three groups: Linear, List and Object. A linear language is one in which only one line of code is processed at a time and it is programmed in a particular style and only one thing happens at a time. Instructions within a linear language are of a *do this* then *do that* explicit style and there's a clear difference between the instructions and the data.

A list-based language is different in that there's little distinction between instructions and data – they are interchangeable. Data at one point can become instructions somewhere else and vice versa. Despite, or because of, this generalisation, these usually-interpreted languages can build up into powerful systems.

Object-oriented languages deal with data as objects and classes of objects which have attributes: A **dog** could be regarded as a sub-class of **animal** and has general animal attributes as well as some attributes specific to itself. An object-oriented language reflects this type of inheritance of attributes.

In a pure object-based language, of which SmallTalk is about the only one, everything including the instructions of the language itself are objects and can have their attributes modified, and new instructions can be added which inherit their attributes.

There are conversions of existing linear languages – C++, Objective C, Object Pascal and so on – which take object-oriented concepts and incorporate them into the existing structure. There are also newly designed object-oriented linear languages such as Oberon-2 but none of these are currently available for the Acorn machines.

Exponents of particular languages will argue that my divisions are arbitrary and they are quite right. Arguments about computer languages can become quite religious in fervour so after that overview let's get on to what's available.

> Data at one point can become instructions somewhere else

HelixBasic

Price: £99.95, (£75 special offer from Acorn Computing)
Supplier: PDK Technologies, 4 Meadow Way, Ampthill, Beds MK45 2QZ
Tel: 0525 403541

WE featured a review of HelixBasic in the November 1992 issue of *Acorn Computing* so we won't go into detail here.

Essentially it allows multitasking programs to be written in a language very similar to BBC Basic. But it takes all the complexity of Wimp management away from the programmer. The language is interpreted and runs a little sluggishly although a compiler is on the way.

The multitasking editor makes program creation very simple and the programmer does not require detailed knowledge of the Wimp. But by protecting the programmer from the Wimp complexities, some facilities are not available.

If you don't want to be protected from the Wimp system this language is not for you. But if you just want to program and aren't bothered about learning how to use the Wimp, HelixBasic is ideal.

Producer

Price: £45
Supplier: Partners in Education, Number One, Clubley Estate, Mont-a-L'Abbe, St. Hellier, Jersey, Channel Islands.
Tel: 0534 74005

PRODUCER is a desktop program that provides a graphical method of programming in a window. On running the application you are presented with a window containing a grid.

A menu accesses six windows from which you select icons that represent program operations, then you put these on the grid to form the program. In effect you create a flowchart of your program on screen which is then compiled and run.

The icon graphics are large and friendly, and the creation process is quite simple although I'd have preferred to be able to keep the icon selection windows on screen.

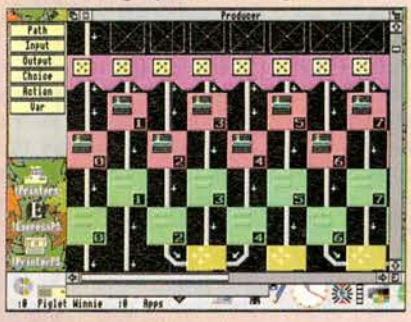
The icons allow you to make decisions, produce screen and sound output, input single characters, lines of text and so forth. You can also use the Concept Keyboard for input.

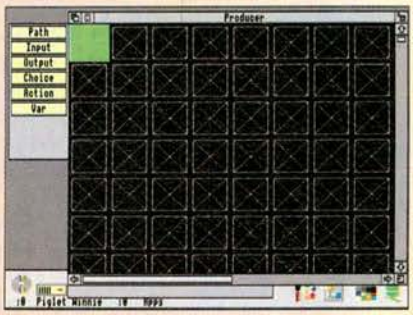
Options allow the program to jump to routines which can be prepared on other grids. Once the program is finished a separate compilation program will turn it into a working application.

The program functions well enough but will only work if you're in Mode 15. This is extremely aggravating as I use Mode 28 for 256 colour work – some monitors won't even allow you to enter Mode 15.

Flowcharts are pretty much out-moded as a program design method nowadays. A more structured approach would be easier to implement as a graphical programming system anyway, as well as providing much better debugging facilities.

Producer is *okay* and many people may find it useful as a tool to start programming, but it needs a some work smoothing out the niggles.





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This is a superb package which anyone who is at all serious about drawing or producing graphics on a computer should buy immediately. Steve Bruntlett • Micro User • July 1992

I can only congratulate 4Mation and Jonathan Marten for producing such a powerful drawing package. Vector is a must for your Christmas list to Santa Claus!
Tord Eriksson • Archive • July 1992

It's a really super program which surely will become a must for any serious drawfile creator. Des Thomas • Archimedes World • June 1992

If I had to write a priority list for a new Archimedes owner it would look something like this:
1. Vector – this is so much better than anything else available.
2. Chameleon – I will use this package a lot – it really delivers a new dimension to vector graphics. Tord Eriksson • Archive • June 1992

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- use a sprite to fill areas – the window in the illustrated sprite was filled with another sprite
- print screens as they are grabbed or after saving
- save sprites in a compressed format
- sort a spritefile according to name, mode or size
- rotate, shear and flip sprites
- convert old BBC screens to sprites
- add borders of any size or colour to a sprite
- crop a sprite in a variety of different ways
- rotate, move and copy parts of a sprite
- undo the last change
- draw shapes, including segments, sectors and rays
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- fill areas using lots of different effects
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- display sprites in a carousel

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Desktop BASIC Editor

- DBEdit is a full Wimp based Risc OS multitasking editor written in machine code for compactness and speed. You can edit a 500K program on a 1Mb machine.
- BASIC, Command, Obey, PostScript and Text file types are supported.
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4MATION

ABC (Archimedes Basic Compiler)

Price: £99.95 (excl. VAT)
Supplier: Oak Solutions, Suite 25, Robin Enterprise Centre, Leeds Road, Idle, West Yorkshire BD10 9TE
Tel: 0274 620423

RiscBASIC

Price: £79 (exc. VAT)
Supplier: Silicon Vision Ltd., Signal House, Lyon Road, Harrow, Middx HA1 2AG
Tel: 081 861 2173

THESE two compilers have as their goal the ability to convert standard BBC Basic programs into machine code and as such both will compile most programs successfully, although a number of restrictions are standard to both systems.

Commands that are only allowed at the prompt in immediate mode, such as LIST, aren't permitted – they shouldn't be in your program anyway. In fact the only real restriction applies to any command that requires the names of variables to be available. For example using the EVAL command:

```
A% = 13
B% = 14
Z% = EVAL("A%+B%")
```

Or reading a variable from a DATA statement:

```
READ N%
DATA A%+B%
```

Both these are forbidden as they would require keeping a complete interpreter along with the compiled code to evaluate such commands which defeats the whole object.

There are one or two other things that Interpreted Basic allows that both compilers object to, but these restrictions can be put down to encouraging good programming practice anyway.

Machine code instructions included in the Basic are dealt with differently. RiscBASIC assembles the instructions when the program is compiled while ABC keeps the instructions in Assembly code and assembles it when the program is run.

There are advantages and disadvantages to both approaches. For example, you can't perform conditional assembly with RiscBASIC but its code is more compact. Both manuals recommend that you do any assembly separately anyway and load the code from the program instead.

Of the two compilers available for BBC Basic V, ABC has the most additions to make it more like a *real* language and associated compiler. It allows you to define constants:

```
DEF height% = 33
```

include dummy procedure and function definitions so that you can call external routines:

```
DEF EXT PROCrummage(C%)
```

And can specify which libraries to use with:

```
DEF LIBRARY
```

RiscBASIC produces standalone code while ABC has a library module that must be loaded for any program to run. If you only have one or two compiled programs the RiscBASIC method is better as the programs only contain the routines that are needed.

But if you have many programs ABC scores because there's no duplication of routines as they are all held in the library module.

In use RiscBASIC provides a more interactive environment and Silicon Vision are currently developing the program to link in with Acorn's Desktop Developer's Environment.

On the whole the *attitude* of RiscBASIC and its manual is techie. ABC has a more user-friendly feel to it although the development environment is less flexible.

Both programs provide lots of user options to switch facilities on and off. For example you can prevent the programs checking to see if Escape has been pressed after the equivalent of each Basic line has been executed. This speeds up the program a lot.

Both compilers allow you to create relocatable modules as well as applications without any difficulty although you can't test these under the interpreter before compiling them. The ABC manual doesn't recommend using Basic for modules because it's too slow.

Desktop C

Price: £185 (exc. VAT)
Supplier: Acorn Computers Ltd., Fulbourn Road, Cherry Hinton, Cambridge CB1 4JN.
Tel: 0223 254254

C IS, perhaps, the most common development language in use in the world – it is also very standardised. Application programs and many games, on almost every personal computer, are created with C and along with its high level of standardisation the troubles associated with moving programs from one system to another are eased considerably.

C, perhaps more than most other languages, is based around the concept of routine libraries. The core language contains no output facilities, no input routines, no special maths functions, no string handling, in fact almost nothing the average programmer needs.

All these facilities are provided by standard libraries: A set of standard definitions, a set of standard string handling routines, input and output functions, file handling functions

Charm

Price: £5.99 (inc VAT and p&p within UK)
Supplier: David Pilling, P.O. Box 22, Thornton Cleveleys, Blackpool FY5 1LR.

CHARM started life on an 68000 development system – so the documentation states – and was eventually ported across to the Acorn 32-bit machines by the original author. It's not a language with a wide user base and isn't available on other computer systems.

As a language it is most like C but where that language uses symbols, Charm uses words. For example in C a pointer is indicated by * whereas in Charm uses *ref*.

Perhaps the most important point in Charm's favour is the fact that it occupies just 180k and is memory resident. It can be used on a 1Mb machine with just one floppy drive and no hard disk provided.

It is good introduction to C-type languages and is quite capable of being used to produce good-sized applications and, with the addition of a library of wimp commands, you can create multitasking programs as well as relocatable modules.

It comes with its own machine code assembler, linker and program editor although there's no need to use the editor as !Edit will work just as well, and if you're already familiar with that it will be easier.

The main disadvantages are the fact that it works from the command line and does not integrate well into the existing development systems.

Modifications to allow the compiler and assembler to use the *throwback* error reporting system along with compatibility with the ARM Procedure Call Standard would make it far more attractive.

and so on. The way you call these functions is the same regardless of the system on which the program has been compiled. What each function does is the same on every system, but the exact way the purpose of the function is achieved is certain to differ. How you send text to the screen on a PC is different to how you do it on an ARM-based machine.

Like most languages C has its own philosophy which you have to get your mind around before you can put it to real use. In C the concept is best summed up as involving pointers and functions: Everything is an object that can have pointer to it and all functions return values but that value can be discarded, if you wish, without any complaints from the system.

C is one of the strictest languages in terms of objects in being of specific types and not allowing objects of different types to mix – called being *strongly typed*. For example you can specify two variables:

```
int i = 3600 ;
char *c = "hello" ;
```

The first is an integer *i* which is given the value 3600, the second, *c*, is a pointer to string. Now *pointer to a string* is a specific type and actually contains the memory address of the string, which is a number. But you can't do this:

```
i = c ;
```

because the two variables are not the same *type* – even though they are both numbers. But C allows a complete cop-out from these restriction:

```
i = (int) c ;
```

You can force any variable to become the same type as something else as long as they are fundamentally the same, and it's totally legal. There's not a lot of point here but it becomes very important when creating real applications.

Acorn's Desktop C is a standard implementation of the language but it is provided with a whole set of libraries that make the creation of multitasking programs very simple – at least it's a lot simpler than building up the whole thing yourself.

Of course if you use these libraries your program ceases to be portable to other machines but this is a small price to pay.

Along with Desktop C you also get the Desktop Developer's Environment with the stupendous debugging program which allows you to step through a multitasking program as it runs so that you can find out where it's going wrong.

The system is easy to use and very friendly although you need a good-sized hard disk and at least 2Mb of memory for it to be of practical use.

Next time...

To round up the linear languages we have Forth (both public domain and by Silicon Vision) and Pascal, then we move on to the list languages – EdScheme from Schemers Inc., Prolog by KeyLink, XLisp from David Pilling plus a section on Logo.

Finally we'll cover the object-oriented language SmallTalk-80 by SmallTalk Express and the hoped-for Objective C.

I-APL

Price: £11 (exc. VAT, inc. p&p)
Supplier: I-APL Ltd., 56 The Crescent, Milton, Weston-super-Mare, Avon BS22 8DU.

I-APL is the personal computer version of APL which stands for *A Programming Language* – honest – which itself is derived from a mathematical notation. There are two fundamental differences between I-APL and the average language.

The first is relatively simple to show and concerns how things are calculated:

```
5*6+3
```

In a standard language this would be evaluated to 33. The multiplication is done first because multiplication is considered to have a higher precedence than addition. In I-APL the result would be 45 because all functions and operations have exactly the same precedence and they are evaluated from right to left.

In I-APL the multiplication sign is x not *, which is used for *to the power of.*

To ensure that the multiplication is done first you would put it in brackets, (5x6)+3. Although this may seem an odd approach there are two reasons for it: The concept of precedence is completely arbitrary, a mere convenience, and not having it makes creating the I-APL interpreter simpler.

The second fundamental difference is far more more important. I-APL deals with vector numbers with the same ease as single numbers. For example entering the above calculation at the I-APL prompt line has this effect:

```
5x6+3
45
```

but you could just as easily write:

```
1 2 3*4 5 6+7 8 9
```

and the result would be:

```
11 26 45
```

It's this ability to handle vectors without lots of complex looping and instructions that makes I-APL unique. You can generate an array of 1,000 random numbers without any being repeated with just:

```
+H <= 1000?1000
```

This returns a list of 1,000 random numbers in the range 1 to 1000 with no repetition and puts them into a variable *H*. The plus at the start prints it out. Try that in any other language.

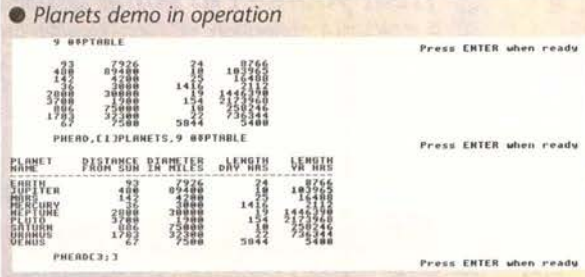
You can define your own functions and so extend the power of the language, though this is no harder or easier than in any other language.

The problem with I-APL is that it has a large number of special symbols which do not appear on the average keyboard and this, coupled with the huge number of built-in functions, makes it a hard language to get to grips with.

The I-APL aficionados will be jumping up and down and complaining that just isn't true: It's easy to learn, easy to use, it's so powerful and so cheap. Well there's no question that it's powerful and it is reasonably priced – a commendable ploy to encourage people to try it.

The learning curve for I-APL has a very sharp incline, but then at such a low price perhaps that doesn't matter. The best user of I-APL is someone who enjoys programming and is looking for something a bit different – you can issue SWI calls so the operating system is available.

● *Planets demo in operation*



● *Spot the interesting I-APL symbols*

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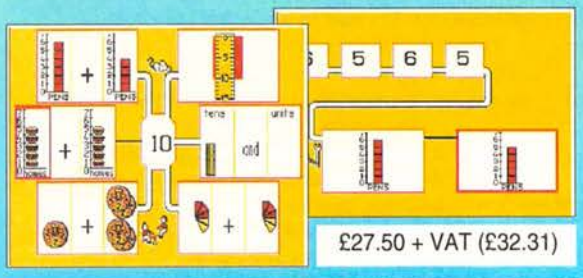

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In a dragon's eye

THE BBC 8-bit version of **Through the Dragon's Eye** was released some years ago tying in with the BBC Schools television programme. In a joint venture with Longman Logotron (0223 425558) this package is now available for the 32-bit range.

This ties in with the broadcast of Look and Read: Through the Dragon's Eye which is scheduled for 1993.

Through the Dragon's Eye is an adventure game where you must help to save the mythical world of Pelamar. Its life-force – the Vettacore – has exploded and you must find the missing pieces.

Your guide is the mighty dragon Gorwen and you are also accompanied by Scott, Jenny and Amanda. No one in Pelamar can read and that is what you're there for. There are clues and puzzles and a bit of trouble with some furry creatures called Widgets.

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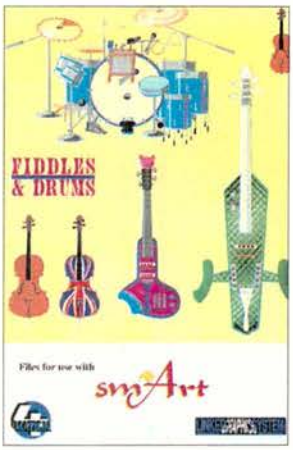
TWO new resource package for 4Mation's (0271 25353) smArt package are now available, priced at £16 each. Fantasy gives you beautifully drawn wizards, dragons, goblins and heroes, while Fiddles and Drums provides percussion and string instruments old and new.



CD-Rom impact

THE first initiative in the Department for Education funded CD-Rom in Schools Scheme is now complete and the National Council for Educational technology has published a 60-page evaluation report based on visits and responses from most of the 560 participating schools.

The arrival of CD-Rom technology has been viewed with tremendous enthusiasm – primarily as an easy to use and fun to use alternative reference and research tool. In most instances the schools confirmed that CD-Roms help bridge the gap between traditional and new technology information sources, enabling students to be more selective from a far wider range of material.

Pupils have also been encouraged to use the school library more while children with learning difficulties have found the graphical presentation especially helpful.

The Department for Education has now provided an additional £4 million towards the purchase of CD-Rom drives by Local Authorities with £700,000 for the development of new British educational CD-Rom disks. With this extra incentive Acorn's CD-Roms will get a big boost.

Seasonal activities

FOR people still in a Christmas mood, there is a range of packages which have special Christmas resources as an added extra. For instance NW Semerc's (061-627 4469) Phases can be put in the festive mood with the Christmas Disk Pack 2 priced at £12.

There are borders, pictures depicting the Christmas story as well as sprite files of Father Christmas and so on. Overlay keyboard support is also included.

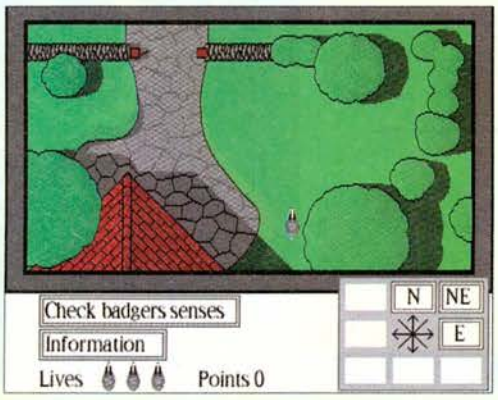
It's a badger's life

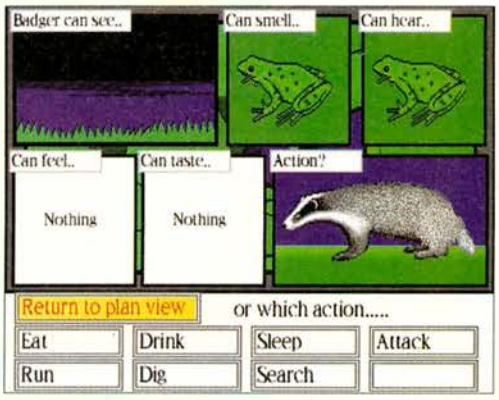
SHERSTON Software (0666 840433) are due to release their next Simon Hosler – of Crystal Rainforest fame – education adventure at Bett '93. Called Badger Trails it is a comprehensive study of badgers in the wild including a video covering a six month period spent watching and filming.

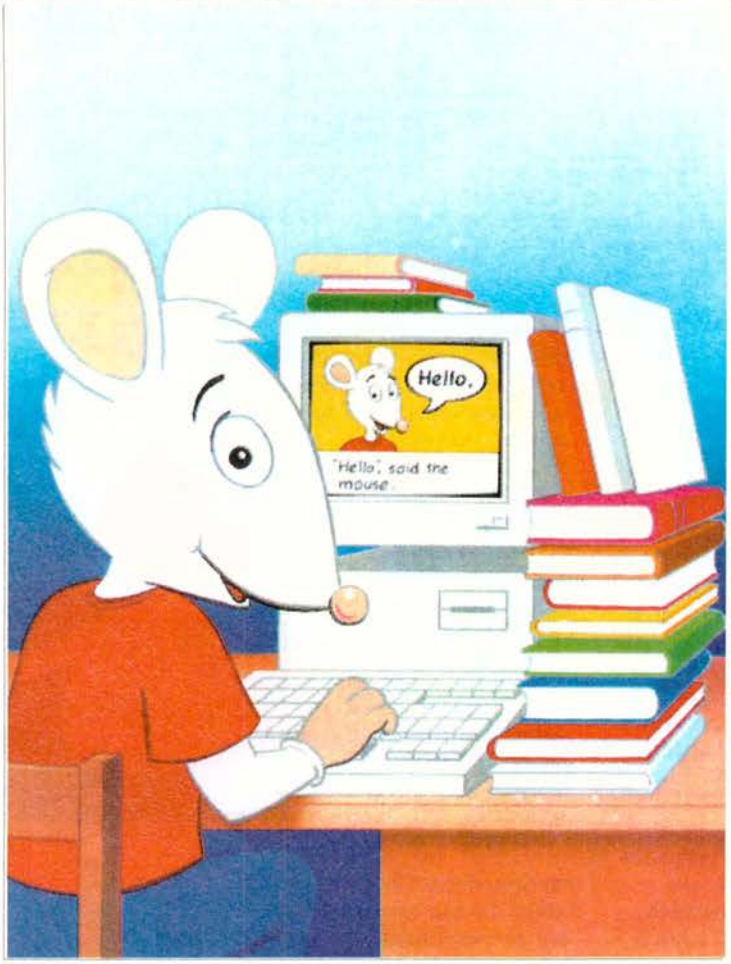
A beautifully illustrated book links the video to the software adventure. After watching the building of the hide and the life of the badger family, the film crew leaves inadvertently taking one of the furry stars with them.

Our hero then finds himself in strange territory and the adventure covers the three days it takes him to return home. The children take on the senses and experiences of the badger as he uses his poor eyesight and enhanced senses of smell and hearing.

The package is completed by a disk of clip art and a Highlighter file and is designed with years 3 to 5 in mind and will cost around £35.







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THE BIG BLACK CAT ALOGUE

Two timing

Frank Jukes looks at a new implementation of pelmanism

PRODUCT SPOTLIGHT

Product: Gemini
Price: £29.95
Supplier: Cambridgeshire Software House, 7 Free Church Passage, St.Ives, Cambridgeshire PE17 4AY.
Tel: 0480 67945

MOST children will – at some time or another – have played a game based on discovering matching pairs within a set of cards placed face down. This kind of game has been transferred to the computer in many forms, quite often as an element of an adventure.

Gemini, from Cambridgeshire Software House, is dedicated to the concept and will be useful both at home and at school. Rather than providing a brief diversion within another more extensive program, it explores the theme and provides a variety of opportunities for matching and learning while developing memory and concentration.

Suitable for use with children as young as 4 and 5 years of age – for whom matching activities are a significant and important part of the learning process – the program remains relevant right through the secondary phase where it could be useful in special needs departments or in the teaching of second languages for example.

At home it could be used with the minimum of supervision to provide children with an activity which would require more involvement than the average TV programme.

Gemini comes with a program disk containing the program, !System, !Fonts and two further directories, Makeown and Games1. Games1 contains 6 ready to play games and there are a further 15 games on the games disk.

The very simplest of the games consist of just three pairs of matching cards while the hardest – with appropriate names such as Stinker and Brutal – are made up of 20 pairs. The cards range from pictures of cats to dinosaurs and from the names of colours in German to a selection of fruit and vegetables.

This variety – allied with the ability to produce custom-made sets of cards – is the primary strength of the program which is enhanced by the opportunity to display a message after each successful match.

Playing the game is simple. After loading Gemini on to the iconbar double-clicking on a game directory automatically loads the files and presents either 6, 10 or 20 blue patterned rectangles. Clicking on two of them turns them over to reveal whether or not they match.

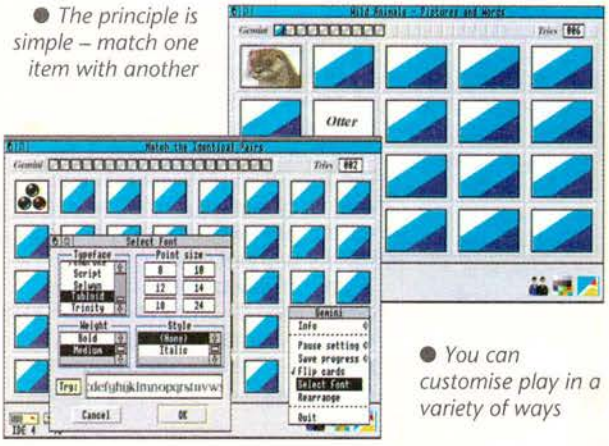
Unmatched pairs are returned to their previous state while matched pairs display a grey pattern and are taken out of play. A record of the number of attempts is automatically kept up to date as is the order in which choices are made.

● *Correct answers can be rewarded with information*

This latter record is potentially quite useful as it can be saved and then later replayed either to continue an interrupted game or to see what, if any, strategies the player is applying to the matching task.

The Makeown directory on the program disk contains the blank files necessary for custom-made games to be prepared at home or at school. To prepare a game the sprites to be used are dropped into an empty sprite file window from Paint and then saved. If text is to be matched it too is saved as a sprite.

The supporting text facility, which displays a message on screen after a successful match, is equally easily implemented by altering and saving a simple Edit file. Again, this feature too has potential, both as positive feedback and as a learning opportunity if, for example, the text names the pictures just matched.

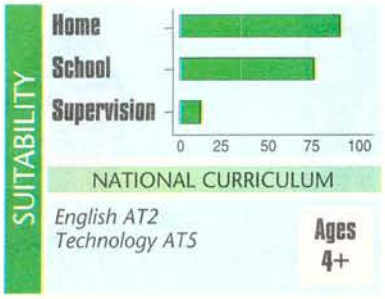


● *The principle is simple – match one item with another*

● *You can customise play in a variety of ways*

Summing up

Gemini is a deceptively simple program. Used imaginatively it has the makings of a very useful tool in a variety of situations at home or at school with very little adult support. I especially like the ease with which individual sets of cards may be prepared for use by specific players or to accomplish particular learning outcomes.



Charting progress

Rog Frost evaluates a new charts and graphs program

Rog Frost has taught in Wiltshire comprehensive schools for more than 20 years. His present post is Information Technology Co-ordinator, in a school for pupils aged 11-16.

PRODUCT SPOTLIGHT

Product: Graph_It
Price: £25
Supplier: Sherston Software, Swan Barton, Sherston, Malmesbury, Wiltshire.
Tel: 0666 840433

QUITE a lot of the established software companies have produced graph and chart packages. Now the education company, Sherston, have joined the fray. Past indicators suggest that they back winners, so it was with great interest that I booted up my copy of Graph_IT.

This program differs from the others though – for a start there's no editor for entering labels and numbers. The first screen shows a set of graph axes and the program toolbox.

The toolbox has a friendly look to it and is similar to the one used by Draw, but it can be by-passed by the mouse menu for most operations. Graph_IT is Risc OS compliant so its style will be familiar to the intended school-age users.

Graph_IT can produce the main types of graph – bar, line, scatter and pie. These can be shown with a 3D effect where appropriate, with colours selected automatically or manually. The background grid for bar charts really sharpens up their display and labels can be added using outline fonts.

Charts can be printed from the program by standard drivers or saved to disk as drawfiles. These can, of course, be loaded into Draw, Chameleon or other DTP packages. Here further editing or colour changing can take place.

Graph_IT has no text justification facility and does not allow for a pie chart to have one segment pulled out of the pie as a highlight. These features can be added by Draw.

Three layers can be created though. This means that three charts can be displayed on one set of axes.

With pie charts, three sets of data can be stored, but only one graph can be displayed at a time.

It is in the field of data entry that Graph_IT is very different from its opposition. First of all, the toolbox is used to select Edit Data. This shows a set of bars all with handles on the top. These handles can be pulled up and down, lengthening or shortening the bars.

If pinpoint values must be entered, a small text entry box is available to type in values for both the X and Y axes.

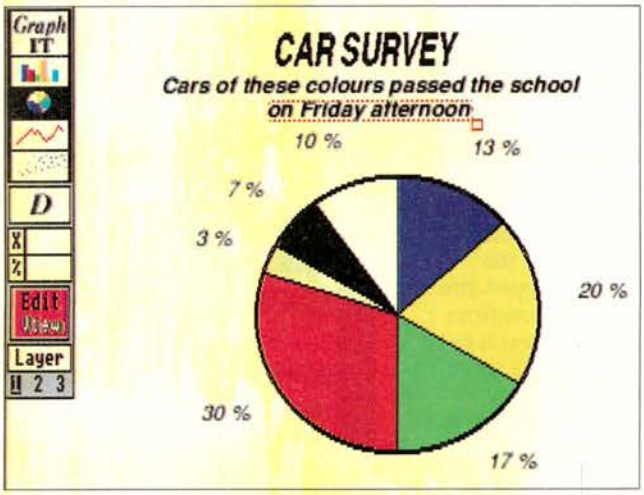
The children who used the program, though, found it easiest to edit a bar chart and then use the toolbox to change to another type of graph.

Editing a pie chart can cause particular problems since no actual number values are involved. Changing to a bar chart from a pie can generate meaningless data.

Now comes what, for me, is the major problem with the program. The values for the axes must be set up first, since changing them on a ready-made graph changes the values entered.

Supposing the Y axis was set up to go up to a value of 10 in 10 steps and then you ask it to go up to 20 in those 10 steps. All of the points on the graph will get their values doubled. This can have some value, but most of the time it is an irritation.

Adding text for labels is easy. Users of Poster will find it particularly simple since the same keyboard shortcuts apply in Graph_IT. Text is entered via a text entry box and can then be moved or re-sized under mouse control. Any font which you have in your current !Fonts directory can be used.



● *With pie charts only one graph can be displayed at once*

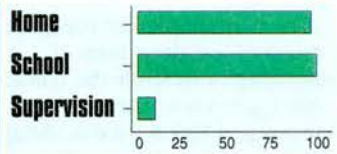
Summing up

I have no hesitation in commending Graph_IT to junior and secondary schools and also to individuals who need a basic graphing package.

There are a couple of points which are an annoyance but the very intuitive style of use makes up for the problems. The proof of any education program is in the children. At my school, the youngsters cry out for my personal single user copy of Graph_IT rather than our usual product.

Well done Sherston. You've done it again.

SUITABILITY



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The DOMINO effect

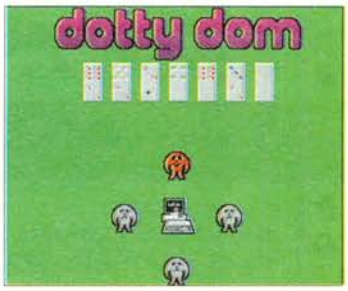
Marshall Anderson takes a look at a new program for the Concept Keyboard

PRODUCT SPOTLIGHT

Product: Dom
Price: £25
Supplier: Partners in Education, 1 Clubley Estate, Mount-a-l'Abbe, St Helier, Jersey, Channel Islands.
Tel: 0534 74005

DOM is a new package which is basically dominoes played on the screen from a Concept Keyboard. PiE supply the !Concept application which caters for most common configurations of Concept-style keyboards. The overlays are provided in black and white for both A4 and A3 sizes.

Taking the game at its most straightforward with all the defaults left in place we are first presented with four Doms, little blobby creatures in uniform grey. These are reflected on the overlay – press one and it changes to a colour while visibly cheering up.



● *Getting started in a game of Dom*

Let's choose just one Dom and get on with the game. It's not made entirely clear in the instructions but choosing one Dom will have you playing against the computer while choosing two to four will leave you with all human players and no computer.

The display for the game shows the computer and four Doms – no matter how many players you selected – the hand in play at the top of the screen and the actual game along the bottom and growing up the sides. The program decides who is to go first and highlights the Dom or computer so you know what's going on.

Play now moves back and forth as you would expect with knocking available and the computer making sure that no illegal moves are made. However, you only play the seven dominoes you started with, there is no provision for picking up the remaining ones.

You are shown the computer's hand as the game progresses, though I would have liked to have seen an option to turn this off and make things a little more challenging. At the end the winner is declared but scores are not shown.

The main options change how the figures on the dominoes are displayed. The default option gives standard layout dominoes with fixed colours for each number.

Some teachers will be a little wary of this as there is a danger of giving children the idea of the *yellowness of three*, a problem discovered with the use of some counting rods. You can get over this by selecting no colour or random colour but again, the latter could cause confusion.

Dots can also be set out on rows and switching between the standard domino patterns and this will avoid the idea that a number has a particular shape.

Numeric dominoes show the figure, with or without the colour option, and you can opt for a mixture of all three. This is a nice idea but I felt the need for a sort of sub-option here – if you select the mixture each domino has, the nature of its display altered each time you see it until it is actually played. I think an option to fix the display once play had started would have been useful too.

The shape option is a useful variation, getting away from specific number, though number is still used to calculate scores at the end with each shape having a specific value.

This is no bad thing, the way the shapes are arranged on the overlay should tell a child what their values are. However, using the random colour with the shapes threw my class into total confusion: *Are we trying to match the colours or the shapes?* The colour-only option offers another variant which can be quite useful but it's worth remembering, with all this talk of colour, that some children are colour blind, more than many of us imagine.

This program could provide one way of identifying that problem.

On the whole this is a well constructed piece of software and does what it sets out to very well. However, *the wonder is not that 'tis done well, but that 'tis done at all.* Why do we actually need this package and what is it doing that could not be achieved in other ways?

● *There's a wide range of game options*

One thing it does is allow a single child to play the game but I can't see a child being hooked on this for long as it lacks gimmicks like animation and a score table that might hold interest. And the computer is such a soulless companion, though this is a more personal feeling.

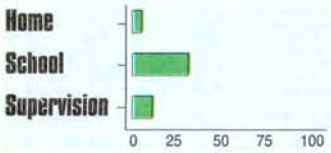
When playing with several children the computer is acting as a referee, but shouldn't children be learning to play fairly without help, and be learning rules themselves?

Summing up

You could buy all the combinations offered as real, physical dominoes that can also be used to build castles, be lined up and knocked down and lost under the sofa.

In school, as a reinforcement tool for low level maths attainment targets, there is obviously some value in Doms but in the home, considering the price and the need for a Concept Keyboard, it is of little use.

SUITABILITY



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Ages 4-7

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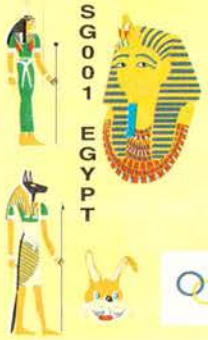

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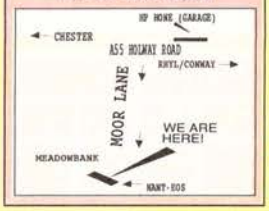

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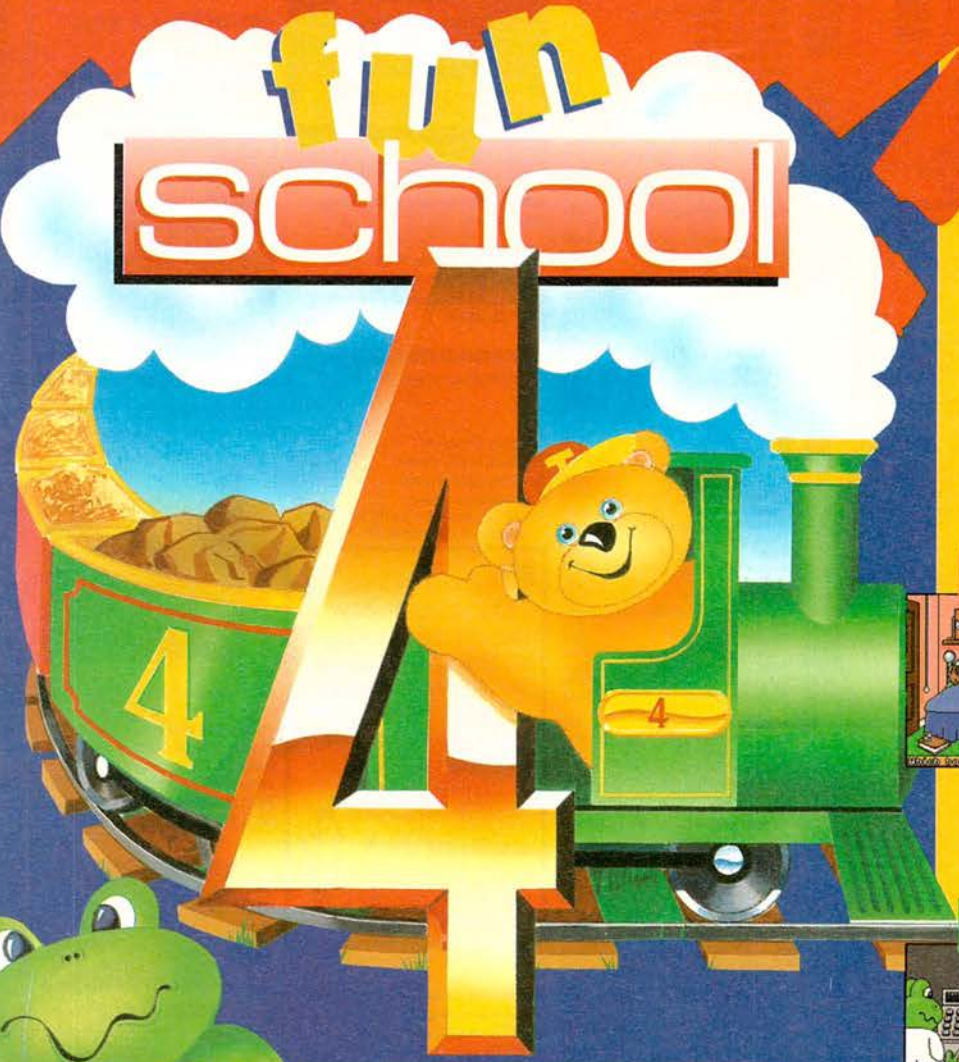
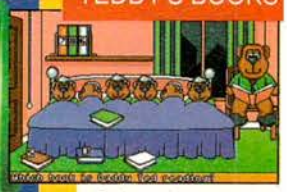


TEDDY'S KARAOKE

Sing along with DJ Ted to popular nursery rhymes.

TEDDY'S BOOKS

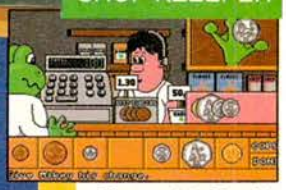


Select the correct number of Teddy's bedtime book.

TYPING

Type the correct letters and words and save Freddy from the crocodile.

SHOP KEEEPER



Shop with Freddy and his friends choosing coins to pay the bill.

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Putting brush to paper

Shelley Birchenough takes up scribbling

PRODUCT SPOTLIGHT

Product: Scribble
Price: £29.95
Supplier: Honormead, Admin House, The Grange, Hospital Lane, Michelover, Derby.
Tel: 0332 510951

ONE of the hardest age ranges to find suitable software for has got to be the pre-school and nursery group. Children under the age of five are more than capable of using a computer when given the chance – provided they don't have to master too many commands or remember a lot of instructions.

They also become bored very quickly and expect instant results – this is why my group of four year olds enjoyed Scribble so much. It is also described as being suitable for special needs, and, although I did not get the chance to use it in that situation, I feel it would be more than suitable.

Scribble is one of the simplest programs I have come across as a tool for art activities. Both abstract designs and proper pictures – using pre-drawn symbols such as clouds, animals and plants – can be quickly and easily created and printed. It can also be used with a Touch Window and artistic teachers or parents can even create and store their own sprites.

Within two minutes of sitting at the keyboard of the Archimedes, my children were happily creating colourful designs on the screen.

Initially, they were more than content to simply draw lines using the colour and brush already selected but I was very impressed when one girl discovered for herself how to change the colour of ink. It took a minimum of teacher intervention to explain the other immediately available options.

Once introduced to the ready-drawn sprites, the children were well away and fascinated by their sudden ability to leave trees and teddies wherever they wanted. Some unusual pictures appeared, with green sheep and a blue sun, but who is to say what is *right*?

● *Let's scribble on the screen*

The program is capable of much more than simple scribbling, though more computer competence is required on the part of the teacher to introduce some of the more stretching aspects of the software.

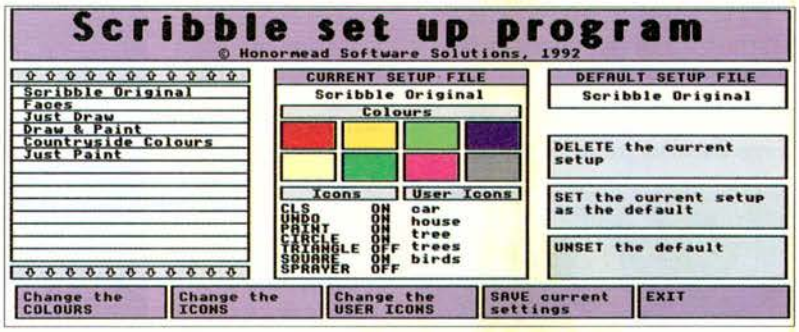
It is possible to ask children to place features on a face, for example, or paint ready drawn pictures. I found it very hard to get to grips with the teacher control parts of the program despite the simply written manual which combined simplistic instructions with the assumption of a wide knowledge of computer language.

One main problem was loading dictionaries of pictures, as they would not load using the given instructions – some devious sidestepping was needed, which not everyone using the program would be capable of.

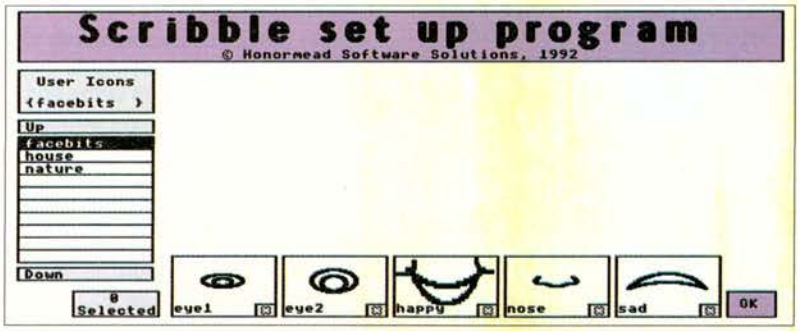
However, there is so much scope for endless creativity with the first part of the program that you don't need the rest, especially as most of it has been done before and lacks originality.

Summing up

For ease of use and appeal to children, Scribble cannot be faulted. My youngsters enjoyed it over and over again and quickly became adept at its use. A definite hit all round!

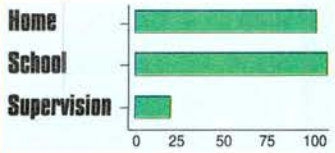


● *Scribble is completely configurable...*



...down to precise details

SUITABILITY



NATIONAL CURRICULUM

Reception and KS 1 Art & Information Technology

Ages 3-Adult

Teddy clothes show

Rog Frost follows Freddy on his next set of adventures

TOPOLOGIKA are well known for their range of effective educational software. This pack adds to the range with a couple of programs aimed fairly and squarely at key stage one of the National Curriculum or, perhaps, at pre-school children.

The programs both feature a regular Topologika character, Freddy Teddy. In *The Puddle*, this cute, furry creature walks along on a rainy day wearing an assortment of brightly coloured clothes.

Unfortunately, he slips and lands up in a puddle. He gets soaked to the skin and must hang his clothes on a line to dry. The problem is to select the correct colour to go with each item of clothing.

This task is made easy to manage because it is mouse-driven. All that a child has to do is point at the item of clothing and click the mouse to mark it and then point at a bold splash of colour.

There are, in fact, just five garments to remember. It sounds simple, but Freddy is only visible with his clothes for a fairly short length of time.

If a youngster makes mistakes in selecting the correct colour a fully clothed Freddy will re-appear on screen and shake his head. This acts as a very useful prompt and is controllable by the teacher from never appearing, through to being on screen continuously.

Well produced graphics – including a rather charming worm who takes no real part in the game – combine with very good sound effects (which can be turned off) to make Puddle a worthwhile and fun program for the youngest computer users.

The Wardrobe is a part of the same pack but comes on its own disk. This program involves four very different scenes and selecting the correct clothes for Freddy to wear. Obviously, he needs very different clothes while making a snowman from those he needs when paddling, gardening or having a bath.

Freddy is displayed in his underwear with a collection of clothes below. The mouse is used to scroll through the clothes and select appropriate items. This is more than just selecting though. Sequencing is a part of this activity since you are expected to dress Freddy in a sensible order. His jumper needs to go on before his coat and hats, while scarves and gloves come last.

When Freddy is suitably attired a short animation takes place which features, for some reason, ducks. These might be of the mallard or bath tub variety and they are accompanied by a rather good quacking sound.

The Wardrobe features a number of teacher options. If appropriate, the sounds can be turned off. Early readers will probably benefit by having the name of each item of clothing written under the picture. These words can be removed if they confuse the youngster.

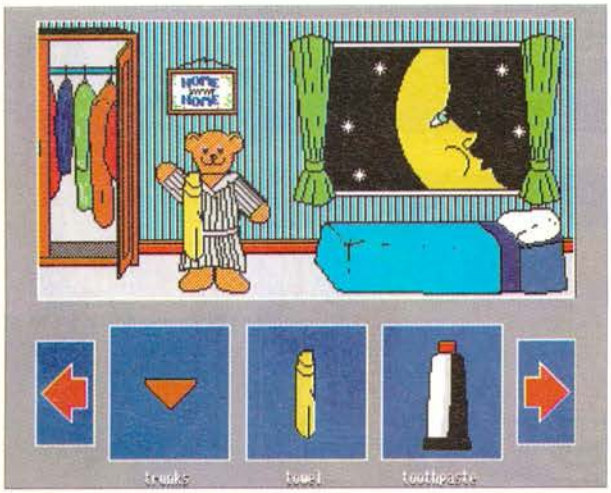
PRODUCT SPOTLIGHT

Product: The Puddle and The Wardrobe
Price: £29.95
Supplier: Topologika, PO Box 39, Stilton Peterborough PE7 3RL.
Tel: 0733 244682

Summing up

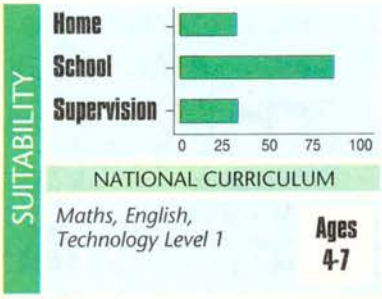
Both these programs are simple but effective. They are aimed at basic skills and do not attempt to be all things to all children. They are probably more useful in a school, with a lot of children, than in the home because one youngster will quickly learn how to cope with the programs and then need to move on to something else.

Infant teachers, though, will like the support materials. These include Concept Keyboard overlays, photocopiable worksheets, poems and songs which combine with the software to make a very useful package.



● *The arrows let you scroll through the options to make sure Teddy is properly attired*

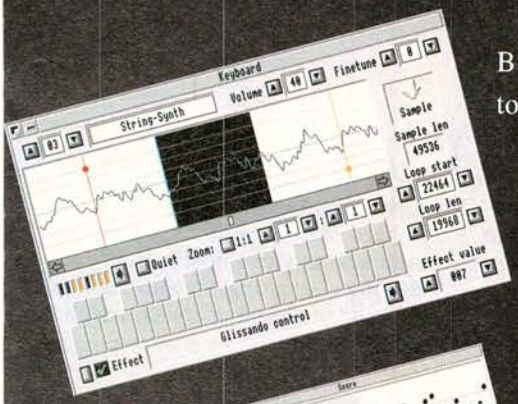
● *Teddy is about to get very, very, very wet*



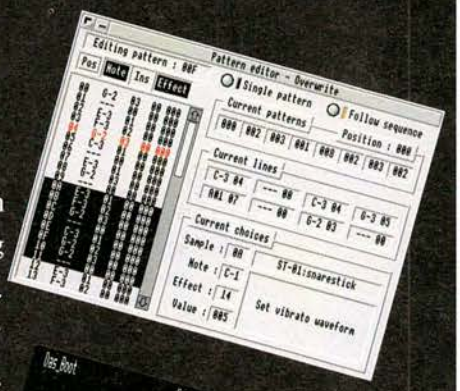
Digital Symphony

The Definitive Soundtrack Editor

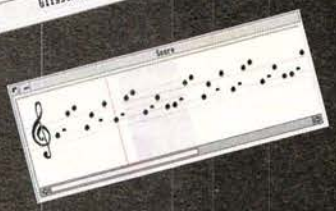
At last, a SoundTrack Editor Package, that is as Powerful as the Archimedes itself.



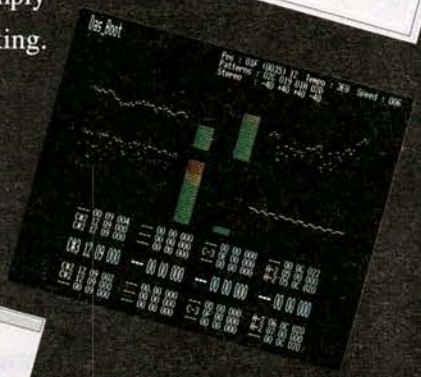
Built in Sample Editor, allows samples to be tailored to requirements.



Pattern editor allows part of a pattern to be Cut, Pasted etc, as well as showing what is happening on the other channels. Effects and instruments are set by simply Selecting, Pointing and Clicking.



Score allows track to be diplayed, using Standard Musical Notation.



Overall control of Symphony is gained using, the Control and Preference Windows.

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Tel: 021 353 6044.

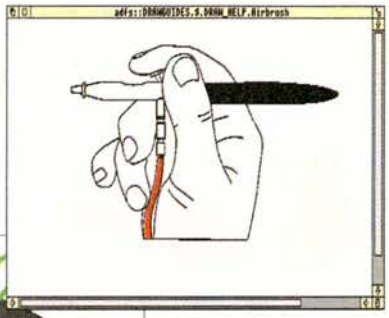
Access VISA

Drawing on experience

PRODUCT SPOTLIGHT

Product: !Draw_Help
Price: £15.95
Supplier: Sherston Software, 8 Court Street, Sherston, Malmesbury, Wiltshire SN16 0LL.
Tel: 0666 840433
Product: SSERC Practical Guides for !Draw
Product: £12
Supplier: SSERC, 24 Bernard Terrace, Edinburgh EH8 9NX.
Tel: 031-668 4421

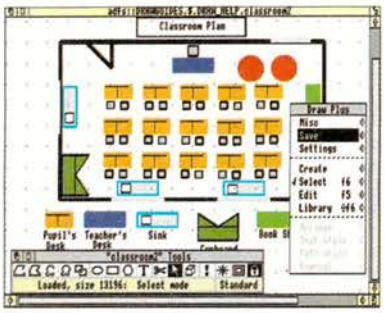
THE release of the SSERC Practical Guides for !Draw has prompted this comparative review of these and !Draw_Help which was published by Sherston Software last year.



● *A whole host of different effects and applications can be enhanced with Draw*

The guides cover the use of the version of !Draw supplied with A300/400/3000 series computers though much is applicable to Draw available with Risc OS 3.

Sherston and SSERC are looking towards the first time user, but even if you've been using !Draw for a while there are still things you can learn. If you're a complete beginner either of these packages is an infinitely better place to start with rather than working from the Archimedes manual which is tedious and minimal to say the least.



● *One of the examples of !Draw_Plus clip art*

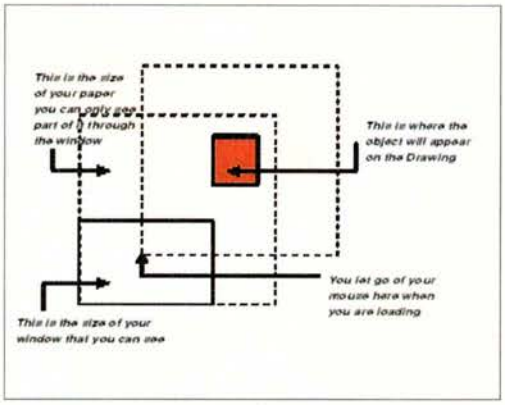
The Practical Guides for !Draw

These guides form the manual that we should have had all along. The material in this 100-page A4 loose-leaf package is also supplied on two disks in the form of full colour files produced entirely with !Draw and !Edit which as the guide claims *will assist !Draw graphics artists whether student or teacher throughout school, college and university education.*

Definitely a package for the home

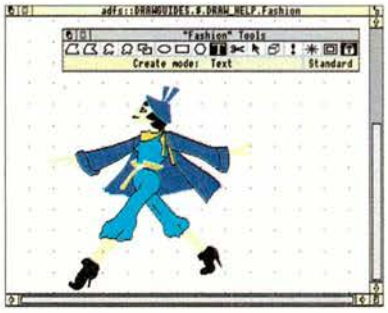
!Draw user as well as for educational users, the guides are a series of pre-punched double sided A4 sheets which comprise seven sections covering: General Information, The Menu System, Using text areas from !Edit, Hints & Tips for working, Using libraries of objects, Using the Grid system.

Each of these sections is further split into single or double sheets dealing with a single feature such as rotating or grouping objects which makes it very easy to use. The information given is well presented and clearly written.



● *SSERC Guides are prepared on paper and disk and are an ideal starting point for first time users of the 32-bit range*

One disappointing feature is the dark grey used for the computer screen which makes it difficult to see the black lines from explanatory text pointing at specific icons or details. This is easily changed when the appropriate file is loaded into



Comparison of packages

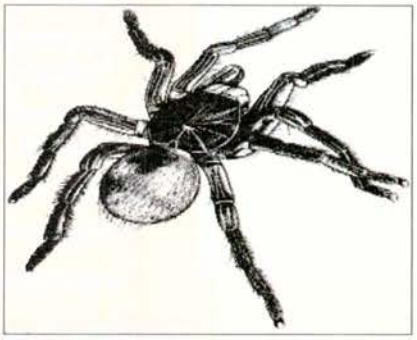
Product	Cost	Format	Disks	Length	Style	National Curriculum
SSERC Guides	£12	A4 sheet	2	100pp	Manual	KS3/4
!Draw_Help	£16	A5 Booklet	2	100pp	Tutorial	KS3/4

Steve Bruntlett assesses two packages to help you find your way around !Draw

!Draw as is any element of the information.

I've already described the guides as a manual but perhaps that should be manual-cum-tutorial as there are many worked examples to show how the features of !Draw work such as the extremely useful one covering text formatting.

The sections on page sizing and the use of libraries were a revelation and I can't remember ever having used the New View option before.



!Draw_Help

This forms more a resource pack and comprises a professionally produced A5 booklet, a very useful A4 size !Draw menu diagram and two disks. The first is ready to run containing !Draw itself, two printer drivers, the !System folder, files for the tutorials contained in the book, two new outline fonts, a wide selection of clip art and examples of work created in !Draw. The second disk contains clip art.

!Draw_Help illustrates some of the serious and inventive applications that !Draw can be put to as well as offering a series of tutorials to help the user get to grips with the many features of this gem of a program. I felt I already knew how to use !Draw but as I read the booklet and went through the tutorials I kept turning down the corner of pages where I came across features or ways of working I'd not come across or fully understood such as the Justify sub-menu which I'd not really explored or used much.

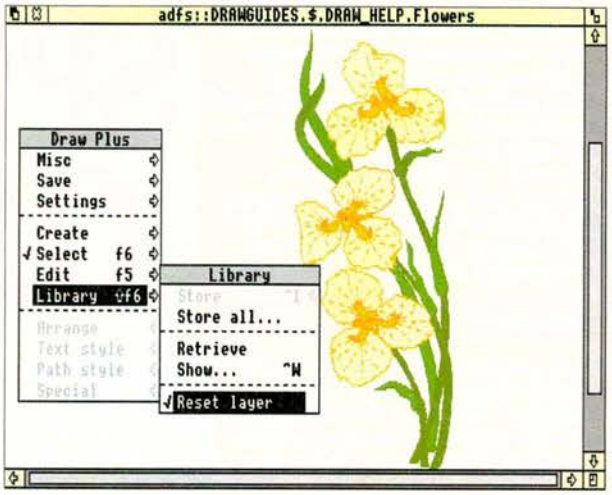
The booklet starts by assuming that you know how to use the computer and operate the desktop. It offers a brief explanation of the scope of !Draw as well as advice on getting started, setting up a !Draw page and explaining the basics of page size, paper limits, Toolbox, Select mode, Select and Style sub-menus and filing operations.

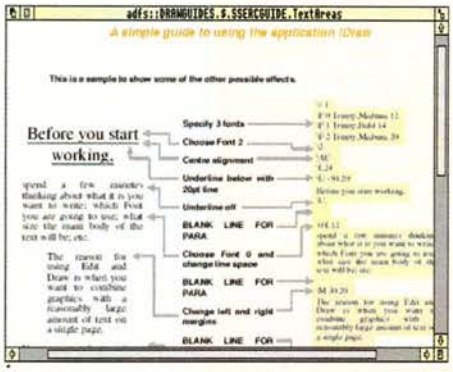
There follows a series of extremely useful tutorials which detail the production of an Invitation Card, a Weather Map, a Pictogram, a Classroom Plan, a Worksheet and a Cartoon.

This is followed by sections on printing from !Draw and configuring the computer for printing.

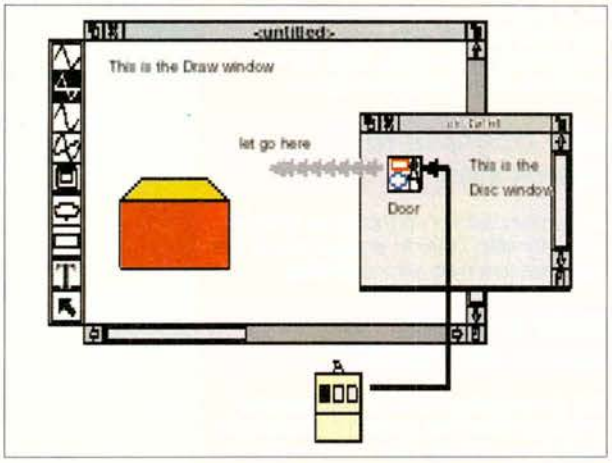
This package is extremely useful for anyone involved in graphic design or for someone who wants to produce posters for local events, plans for extensions, publicity material or even print business cards.

Every school with an Archimedes should have a copy of !Draw_Help if they are at all interested in producing teaching or publicity materials. Home users will find much of use and interest in this package and will benefit from the tutorial sections.





● *The possibilities are endless whatever the drawing tools*



● *SSERC Guides take you through the whole process*

Summing up

The SSERC Guides show clearly how to use !Draw and provide very useful material for use in a home or school situation while !Draw_Help provides a brief introductory guide to !Draw and a series of worked tutorials as well as including two fonts and some useful Clip Art.

Choosing between these two packages is not appropriate as they have different emphasis and uses. Each package does its job very well and both are highly recommended for the home as well as the education user.

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Enhancing the muse

Steve Bruntlett takes a look at two new image processing packages

THERE always seems to be a glut of new art and design packages at this time of year and Imagery and Revelation imagePro are two. They are both packaged as image processors but this is where their similarities end.

Image processing is the ability to retouch, dissect and reconstruct a drawn, scanned or imported image. On other types of machine image processing is kept separate from image creation but on the Archimedes the area is a little more grey.

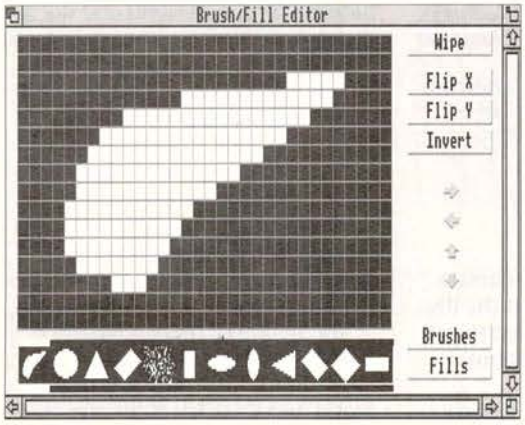
PRODUCT SPOTLIGHT

Product: Imagery
Price: £89.95 inc VAT
Supplier: Palette Studio, 6c/6d Belgic Square, Peterborough, Cambs PE1 5XF.
Tel: 0733 344245

IMAGERY is developed from an earlier product called Archrome, but its features have been extended especially in the area of image processing.

It comes with an excellent manual, with tutorial examples of the production of a demonstration image – also included in a 24-frame sequence on disk – a useful poster, key strip, free telephone backup and a disk of free clip art and Imagery programs which are sent out on registration.

It is described as an *image creation tool* taking over where Paint left off and relies on the use of Paint for printing out images – which seems a bit of a cop out. It has a host of special effects and picture enhancement functions for use on images captured by digitisers or scanners.



● *Imagery's Brush editor is easy to use but doesn't give you real-time tools*

Imagery seems very well thought out with provision for users on a 1Mb system to switch off the undo facility to enable it to run, for example. It works in all 256 colour modes in the desktop but is best used in Mode 15, which is a shame for those with high resolution monitors.

The Paint menu is straightforward with options for single pixels, freehand drawing, rubber banding, airbrush, paintbrush and flood, pattern and graduated fills. The pixels option is fine for detailed point-by-point work but the sketch, airbrush and paintbrush options are so slow in operation – even using ARM 3 – that they're virtually unusable at normal working speed.

The problem is that the line or brush shape lags so far behind the pointer on screen that it's very difficult to draw at anything like a normal speed – that was always the same using Paint.

The Airbrush control and Brush selection are easy to use but they're not real-time tools. The fills are effective and well controlled from the Brush/Fill editor while Transparency is straightforward and effective too.

Temporary storage

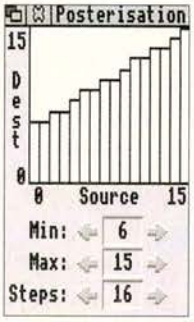
Imagery uses a temporary Preserve/Restore system which allows the temporary storage and retrieval of four images and has some useful Import options which allow you automatically to Centre, Scale or Tile images being imported.

The graduated fills are impressive with sophisticated control over direction, dithering and rotation. A nice touch here is the way that when the Graduated Fill option is selected you can see a ready-made selection for immediate use but only when the window is opened to full size can you see and select from all the other options.

A variety of line styles includes options for OR, AND, EOR, Invert, NAND and NOR. This technical way of working isn't very user-friendly. If ➤

Steve Bruntlett has taught art, 3D design, graphics and photography for 14 years at secondary school level. With an MA in Art and Design Education he has developed a primer for Artisan and held master classes in CAD.

He is now senior lecturer at De Montfort University, Leicester, on PGCE and MA Art and Design courses.



● *One of the special menu items allowing you to reduce the number of shades in a picture*

you were to NAND a red line over a green and yellow background, would you know what the result is likely to be?

This mathematical approach occurs again when using the most advertised feature of Imagery – Wobble. This lets you apply mathematical functions to areas of the screen to make them sheer, wave or wobble.

It's very much a trial and error way of working unless you have a grip on mathematical functions and is not very intuitive though it can be used to good effect. The other mathematical function – which seems to be a hangover from BBC programs – is pixel mapping.

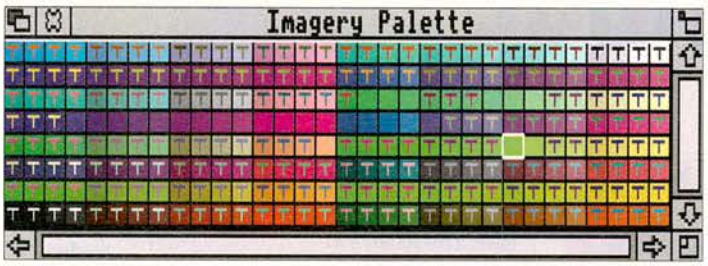
Basically you can box in any four-sided area of the screen and map it on to any other four-sided area. The rest of the Manipulate menu includes Copy, Move, Mirror, Invert, Strip and Rotate area as well as Scale to fit which do what they set out to.

The program provides regular solid and outline shapes and a reasonable text option which seems on first glance to offer Outline, Shadow and Inverse option on text strings. After much frustration and reading the manual I found that these three options were only available on the System font.

Where Imagery does score well is in the options offered by the Special menu. For instance, Trace copies round an area in a single colour, while Smudge gives the effect of painting over an area with a wet brush, the shape of which can be altered by using the Wet brush option.

Tint overlays a single tint over an area of the screen with the Tint brush option doing the same but using one of the brush shapes.

Set frame produces a specified frame. RGB control allows you to change the colour composition of part or all of the screen while Grey scale lets you change all or part of the screen to a grey scale equivalent and Contrast control lets you change the contrast range to brighten or darken the picture.



● *Many of the options and tools are straightforward to use such as the Transparency option*

This is a bit odd to use at first but becomes easier as you understand its effect. Posterisation allows you to reduce the number of shades in your picture to a specific number while controlling the upper and lower limits. If you opt for De-tint you can group tints in specific shade groups in varying degrees to give similar results to Posterisation.

Moving on to RGB graph you can see the ratio of colours over a given area but I can't really see how much use this has compared to the general usefulness of the previous tools.

Colour Scale produces the equivalent of Grey Scale images but in red, green yellow, blue, magenta or cyan. Pixelate allows you make your picture blockier and therefore more like computer graphics. I know what the manual means but can't help feeling that we've been trying to get away from that kind of effect for the last 10 years.

The Filter function is useful for removing fuzzy edges in images from digitisers or from smudged areas of the screen. Colour replace is used to replace single or multiple colours and does what it sets out to do very easily.

Imagery uses LZW compression techniques, but beware to get the advertised 20-30 digitised pictures on a disk – even compressed – you'd have to clean them up a lot.

Summing up

Imagery has a lot going for it in terms of image manipulation and if you want a package just for that purpose then Imagery may be worth buying. If you want a painting package for the same price I'd look elsewhere. Why not try the cut-down version of Imagery on this month's cover disk and see for yourself?

Revelation imagePro

● *The HQ blend effects are stunning but take a long time to process*

REVELATION in its previous incarnations has been reviewed in previous issues of *The Micro User/Acorn Computing*. In the simplest terms it is an image processing program although you can use it to create any kind of pixel-based artwork.

The two programs provided with the previous release of Revelation have now been combined allowing you to drop drawfiles directly into an open page without converting them. The Icon Bar menu has been extended to include a save choices option for its operation and the Risc OS mode has been enhanced to include the same *tear off* menus available in special mode.

A *tear-off* menu behaves exactly as a normal menu unless you move it – tear off – using its title bar. It then becomes a separate item and doesn't disappear with the rest of the menu. This is an idea borrowed from the Unix-based Wimp systems.

The display page option is for those who want to see the whole image without the frame and there are various improvements and developments to the Drawing tools section. The first of which is the integration of the Mark menu into the Tools menu.

The system of mark selection is slightly different as you toggle between the circle and rectangular marks and then select the size you want. The main difference – and, in

PRODUCT SPOTLIGHT

Product: Revelation imagePro
Price: £139 (upgrade option available)
Supplier: Longman Logotron, 124 Cambridge Science Park, Milton Road, Cambridge CB4 4ZS.
Tel: 0223 425558

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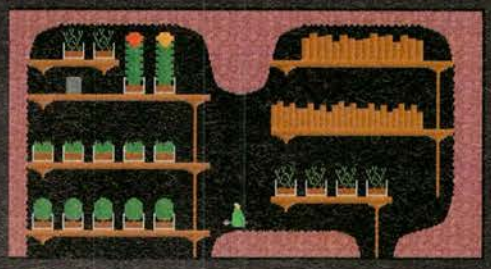

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my mind, one of the best things about the package – is the development of the flat crayon and brush tools into tools of varying density and type.

The regular dither crayon gives an even textured mark regardless of the speed and direction of the mouse while the random dither is mouse speed sensitive and will overwrite itself to increase the density giving a wax crayon-like effect.

Complicated brush

The Brush tool is more complicated. Clicking on the Density Display toggles it to a streaky bristle effect which is speed sensitive. Additionally the user-defined mark can be clicked a second time.

This changes the action so that the mark orientates itself according to the direction of the movement of the mouse pointer to produce a brush-like effect. Textured brush marks up to now always seem to join up to look as though you were scratching away to reveal an overall underlying pattern. Not any more.

The airbrush adds greatly to this increased range of mark qualities as a centre-weighted option has been added to get away from the even footprint. This could look a bit flat depending on how you used the airbrush.

A set of dithered colours increases the effective range of shades available, but this is only on Risc OS 3.

All paste options can produce Sprite masks by changing colour after paste has been selected – most useful. The Effects menu has also been extended to allow effects to be applied in an irregular area using a freehand option.

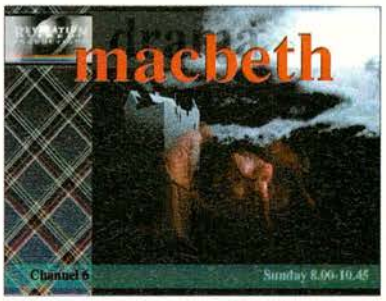
Mosaic or pixellation is a new effect which produces an effect like you sometimes see on Crimewatch when someone's identity is being protected.

This is quite clever but I've yet to be convinced of its use. It seems to be going in the opposite direction to the quest to produce more detail in paint packages, and not less, no matter how nicely patterned the results.

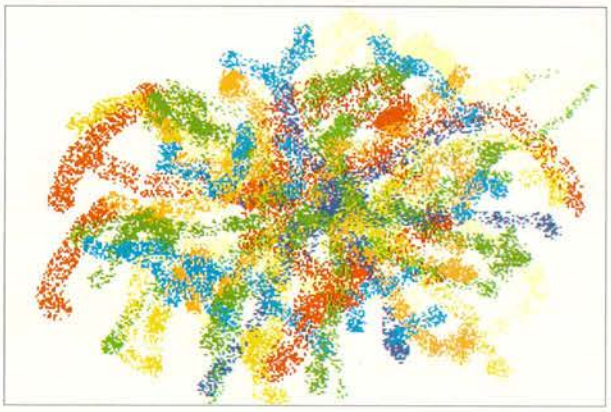
I enjoyed using the blend option on the last version. Now, as well as being able to blend in even more stages and being offered a dithered blend, which gives better results, you can also use a series of HQ blends.

These take ages to process – even with ARM3 – but you can blend images in and out from left to right, top to bottom and in and out of a frame or a circle and the blend gradient is fully editable.

The text handling option is simpler and provides kerning while the Colour Shift dialogue, which was one of the most powerful features of previous versions, has been extended again to include RGB Bias and CMYK Bias. These are essentially different ways of working with the 256 shade palette in 256 colour modes.



● *This promotional material for Macbeth has undergone sophisticated processing in Revelation imagePro*



● *The development of the flat crayon and brush tools gives you access to various densities*

Using the RGB control allows you to produce images which look as though they are being viewed through coloured glass. Moving the sliders up will make blues bluer for example. CMYK Bias can be used to prepare colour separations.

Colour wheel

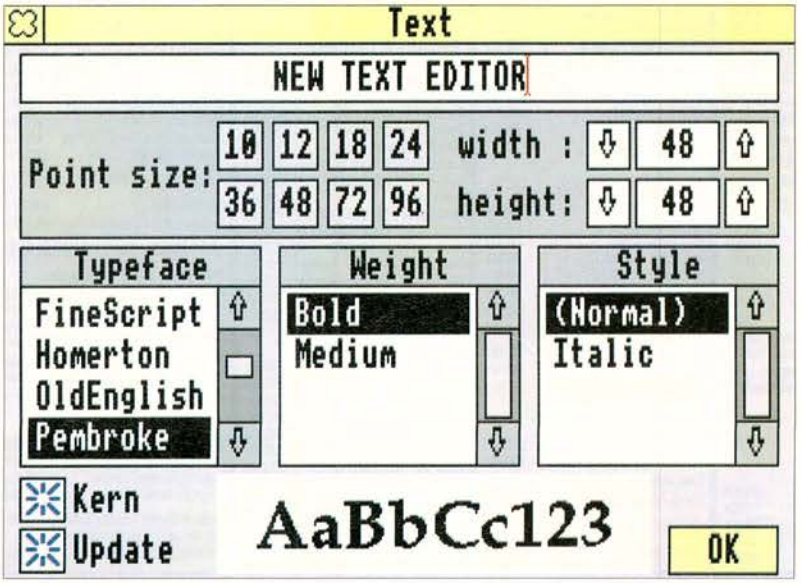
The other new feature is the colour wheel which lets you rotate colour schemes by dragging the Outer wheel round the inner wheel to change yellow to red, green to yellow and so on.

The pointer has a orientation readout while you're rotating the outer edge so that you can tell how far it's been turned. I can see this feature being overused for psychedelic effects but it's a useful facility.

A Grey Shift dialogue has been added to give control over grey-scale images and the default grey-scale profile can be changed to any of the eight provided. These can be edited, flipped, inverted or spread out to increase the dynamic range of images which don't have the full set of 16 grey shades.

This can be useful for increasing the contrast of poor quality images. It can also be used along with the CMYKstrip sprite to ensure an even spread of a particular colour when producing colour separation stencils. These options can be applied to tools if you don't want to work on rectangular areas.

All paste options can produce Sprite masks by changing colour after paste has been selected



● *The text options include kerning which is necessary for the serious user*

Summing up

Revelation imagePro works like a dream and is well worth upgrading from Revelation 2. I much preferred the original packaging and A4 manual but the contents give you a well written and well sequenced worked examples.

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Spit and polish

Steve Turnbull assesses the final production version of ArtWorks, the new graphics package

● *This cute character is mainly composed of shapes with graduated fills – rather than blends – some are circular and others linear.*

LAST month's review was based around version 0.8-ish of ArtWorks, while the documentation was even older. As the review was going to press the final version arrived but too late to make any changes. Here's what you get in addition.

The package comes in a slipbox of the same dimensions as Impression but while that is mostly black, the ArtWorks one is mostly white.

Inside there's the main manual, some additional information and two long white boxes sealed with stickers asking you to refer to the licensing agreement – breaking the seal indicates you agree.

The manual is a very nicely printed wire-bound book of 190+ pages, although it contains a lot of white space. There's no tutorial but each aspect of the program's functions is described clearly.

The two boxes contain 15 disks and the ArtWorks dongle. Now that's a lot of disks and you might begin to worry that Computer Concepts have succumbed to the PC syndrome. But it's okay, the main program and a few subsidiary programs take up only the first two disks.

Disks 3 to 7 contain lots of very high quality clip-art, while the remaining eight contain the 220+ fonts which make up over 156 separate typefaces – so most of the fonts are just single display types used for special purposes, there are only a few complete families.

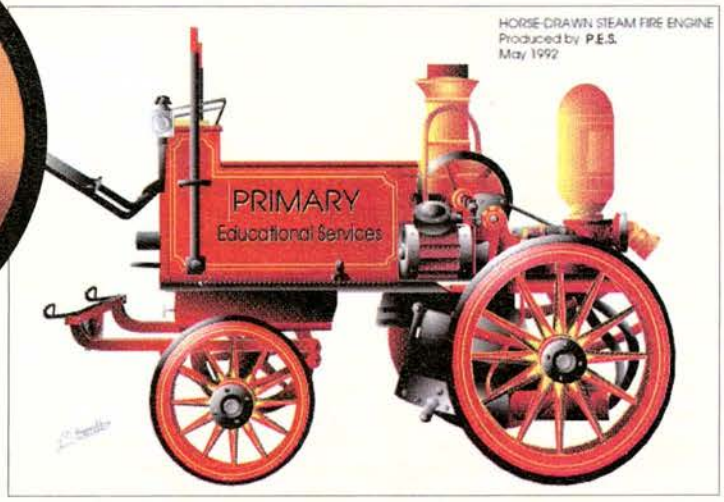
The fonts are held in a highly compressed form and when expanded occupy over 6Mb of space. Unless you have oodles of hard disk space you're unlikely to want them all. In addition any font menus in programs like Impression and ArtWorks will become excessively long.

The **FontBank** – as it's called – documentation recommends placing only a few of the major fonts into your primary Font directory, and keeping a separate one for those special occasions when you need a particular display face. The font installation program is particularly easy to use and allows you to create extra font directories very easily.

Among the other extra utility programs is one I have been looking for – it's called **FlipTop**. As ArtWorks is designed for use by non-techie artists it's unreasonable to ask them to learn all the numbers of the various screen modes to produce different combinations of colours and resolution. After running it you'll see a number – 2, 4, 16 or 256 at present – which indicates the number of colours in the current screen mode. It's iconbar menu presents the usual options of *Info* and *Quit* plus three others.

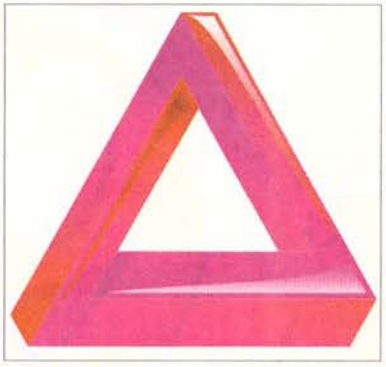
Show modes brings up a window containing a grid with screen resolutions down the side and number of colours across the top. At the grid intersections is a rectangular blob: If it's a yellow square the mode has square pixels, green oblongs mean the mode has oblong pixels, white blobs mean that the mode isn't available on

● *In this clever picture the colours in the gold background are produced by blends while the highlights on the bevelled edges are simple graduated fills from black to white.*



● *A superb and highly detailed piece of work composed of 309 elements at the topmost level and many of those are groups of other elements. From the detail you can see the spokes are groups that have been copied and rotated – the shadow is always on the same side of a spoke.*

The wheel on the other side of the fire engine – as seen through the near wheel – was drawn over the top of the nearer wheel.



● *A popular optical illusion rendered with graduated fills. Red to magenta, and blue to cyan, fills work very well on screen because of the particular 256 colours in the Arc's colour palette.*

➤

your type of monitor.

The highest resolutions are at the top of the grid and the least accurate are at the bottom. The current mode is highlighted by the intersection being coloured red and by clicking at another intersection you can change the mode – as long as there's a green or yellow blob there.

Two columns marked K and M are for future machines that have thousands or millions of colours.

The *Choices* menu item allows you to set up hotkeys to modify the number of the screen size (smaller or bigger) and colours (more or less). These can be saved so that you can just use the hotkeys to alter the screen mode as you work. There's also a countdown option to step through the modes.

Default colours resets the screen palette to its defaults, just the same as the palette icon except the default is contained within the !FlipTop directory. The **NewModes** module is supplied and you can see the effect of adding its extra modes by loading FlipTop before and after NewModes.

Another amazing utility is **!ConvPrint**. This take a Postscript file – output to file via the PrinterPS application – and creates an ArtWorks file containing information for positioning the text with the correct fonts and sizes.

So for file types that can't be understood by ArtWorks directly, or for transferring posters that have been created with, say, Impression or Ovation, this is a good way to do it if you don't want to type the text in again.

If the PostScript file contains any pictures the application will also try to transfer them but it will be too much for the simple Basic program to handle. The trick is to remove any pictures before creating the PostScript file.

● *No blends here in this beautifully stylised picture – each block of colour has a simple graduated fill. You can see how ArtWorks dithers the screen colours to produce the required browns.*

Printing

Printing was an area not covered by any of our professional reviewers. ArtWorks provides very thorough options from the simplest scaling to full-blown control of colour separations.

The first part of the print dialogue box covers size and orientation. You can switch from portrait to landscape, scale to any specific size, reflect the image and specify a screen for half-toning – useful for low quality duplication of the printed image. Plus there's an enormously useful *Fit on page* button which automatically scales the image to the page size of the printer.

Where the image is larger than the printer page size you can opt to *tile* the output – print the image in pieces. You can also control which tiles are printed although this is not represented graphically and you can only choose a numerical range of tiles.

It would have been more helpful to get a graphical representation of the tiles and be able to select the specific ones you want to print. However having tiling is an essential part of a professional package like this, and it's no worse than what's available for the Mac or PC in this respect.

Finally there's the section on what actually gets printed. You can add crop marks to the image – useful when tiling, specify all foreground layers or just the visible ones to be printed, print all the colours – monochrome – or as colour separations.

Setting the separations button makes another dialogue box available which controls the colour printing options. You can add printer's marks to the output so that the colours can be set up properly.

Each colour appears in a scrolling window – for normal four colour printing, Cyan, Magenta, Yellow and Black. If you set up spot colours these appear in the window as well.

The more technically-minded can alter the screen angle for each ink plus whether the ink overprints other colours or not. Finally you can set up the resolution of the target printer – values from 300 to 2540 dpi are available.

Summing up

ArtWorks is a professional-standard drawing package that is lightning fast and remarkably easy to use. It's natural for anyone to want additional features but perhaps the most important feature about ArtWorks is that, because of its modular design, those features can be added.

● *Irregular shaping for 3-D effects is best performed using blends as in this example.*

● *Simple but effective, a circle with a graduated fill. The window effect is produced by white shapes.*

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Chopper Force

...high flyer?

DID you know that the first model of a helicopter was demonstrated in 1784? But it took over 150 years to get a proper flying version into the air safely?

Chopper Force is a mean, lean, crime fighting team, who's aim in life is to foil some nasty terrorists. You and your trusty steed must fly off and eradicate the bounders.

The vector-based graphics are pretty good, with objects to fly round or crash into. The animation on my weary ARM2 is quite smooth and you can view with more camera angles than the cricket on satellite TV.

Sound? Not really. You've got the whutta-whutta of the rotors droning on in the background, the revving of your rocket engine, the odd bang and whizz, but nothing else. 4D games have never been noted for their superlative acoustic attributes and this is no better or worse. We must remember though, children, sounds maketh not the game. What does? Gameplay, of course.

It's not that easy to classify Chopper Force. It's a simulation in the same way that Chocks Away is, but this one's got helicopters in it and you can shoot things.

When you take off, you can climb and fall without moving forwards or backwards, rotate the chopper, plus you can move in any direction by tilting the whole vehicle. Excellent. I push the nose down and start gliding forwards. Oh. I want to go faster than 20 mph. How do I do that? Aha, I activate the rocket motors – 100 mph, really cooking now.

You only get one tank of fuel and no refuelling is allowed. This tends to spoil any strategic aspirations that you may have, as you usually have to simply go for your objective with guns a-blazing and hope in your heart.

Air combat isn't too bad. You usually have to revert to Hover mode, face your adversary, aim and let fly with your guns or missiles. Whether you hit the target is another matter, but you don't want a game that's too easy. Your opponents range from nippy attack helicopters to sleek jets, all of them pretty difficult to kill.

Missions are varied, but tough to complete. You have to do all sorts of things, such as carrying cargo from one place to another, destroying enemy limousines – these are rich terrorists – blowing up terrorist HQs and even escorting your own limousines through dangerous zones.

And those are just from the first 10 missions. The play area is perhaps a bit big and it takes time to complete a mission – five minutes there and five back on the first mission to shoot a black limo on Highway 49.

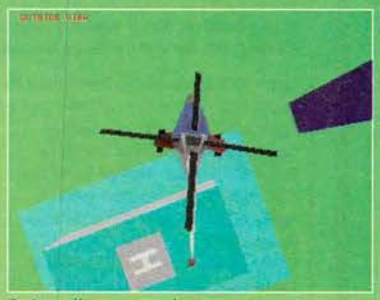
Every few missions, you are rewarded with new equipment. This includes missiles, engines, stabilisers and satellite access. Admittedly, this keeps the game alive longer, with you striving to complete the next mission even if it kills you, just to see the next power-up.

The head-up display is good but it would be even better if the compass turned the right way. Still no harm done because you don't really need it as there's a built-in guide that indicates the direction and distance of the next target.

The game has got several nice touches though. It has level crossings where the barrier goes down as a train goes past and traffic lights that change colour. There are flocks of birds fluttering around and buildings with massive screens relaying the news.

In theory this should be a great game – just about everything is there but it didn't quite work for me.

Ben Reilly



● *Landing on a skyscraper*

● *Private houses add to the realism*

● *Oh-oh, let's get the terrorist swine*

> Every few missions you are rewarded with new equipment

PRODUCT SPOTLIGHT

Price: £29.95
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Guile

...deep thought

PRODUCT SPOTLIGHT

Price: £29.95
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LOST in space you have wondered on to the solar jet stream and into the Azran solar system on the outer spiral arm of the Megellonian galaxy – slightly more thrilling than taking the wrong turn on the M25. Totally on your own you must cross the system on the Orbit Express to escape.

The entire system was formerly a penal colony with all lifeforms living underground in huge caverns hewn from the rock by convict labour. Now it's home to a thriving economy that expanded after Blackhole Monday wiped out the galactic economy. The interplanetary transport craft is manned by frightfully polite but mercenary captains who won't let you on without the price of a ticket.

Guile combines elements used successfully over the years: 3-D vector graphics, trading and piloting your spaceship past hurdles and obstacles from pterodactyls – found on Hermhaeven, the deserted movie set planet – to stalactites testing your expertise and panache. You must pilot the CV2000 – the *around-tunnel Hothatch* – through a maze of underground adventures.

The interplanetary ships leave to schedule and you have a time limit to find goods with which to trade – successfully – to buy passage one step closer to your nearest and dearest. The prose which greets your successes and failures is atmospheric and doesn't take itself too seriously.

You start with a basic amount of money and a ship parked on the teleport dock, by flying north you pass through caverns and tunnels that curve and arch. Here and there are trees, bushes and rocks plus expanses of water – watch out for the water spouts.

In the first cavern there's one bar of gold and one gem but there's no point trying to beam them into the ship just yet. Travelling on you finally reach the end and another teleport station. Landing – you don't have to be too neat about it – and you switch to trading mode where you can buy a unit that will hold the altitude you set, essential for gold collection.

● *Attack by pirates over oil fields*

There's lots of other goodies on offer: Weapons, lots of fuel, shield restoring and so on. Then it's back into the cavern to get that gold, just hang over it and get down close then a long press of the Tab key will beam it up, Scotty. Then back to the teleport station to trade it in for more money.

Pretty simple? Well not quite, sometimes there are caverns barely taller than your ship filled with stalactites and stalagmites that you have to negotiate, tunnels that are scarcely wide enough but descend so rapidly that it takes an ace to negotiate them properly. Then there are the other ships, doors across the tunnels and flying rocks to name a few.

Though not specifically a combat game, there are things to shoot at – like trees blocking a tunnel and vigilantes who don't like the cut of your jib. The early tunnels are just single ones in a straight line, but further on you'll find cross tunnels – then your compass comes into its own.

Guile uses the laws of physics thoroughly: Every time you pick up gold your ship gets heavier and uses more fuel. Some planets have a much higher gravity and some a lot less – and you'll need gold for ballast.

Written by Andrew Martin, the author of Air Supremacy, Guile isn't for the timid but if you want to try something that's a bit out of the ordinary it's definitely for you.

Lazarus

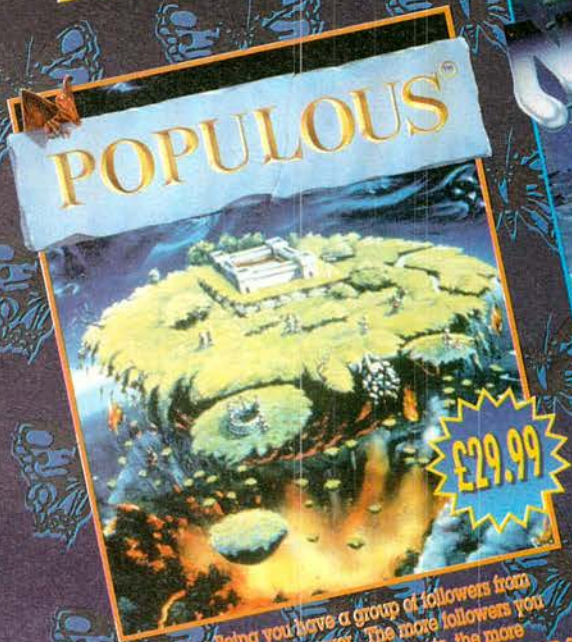
> Guile uses the laws of physics thoroughly: Every time you pick up gold your ship gets heavier and uses more fuel

● *Tackling a tricky wave in level 3*

● *Swamped by enemies in level 5*

● *Juvenile craft attack a teleport station*

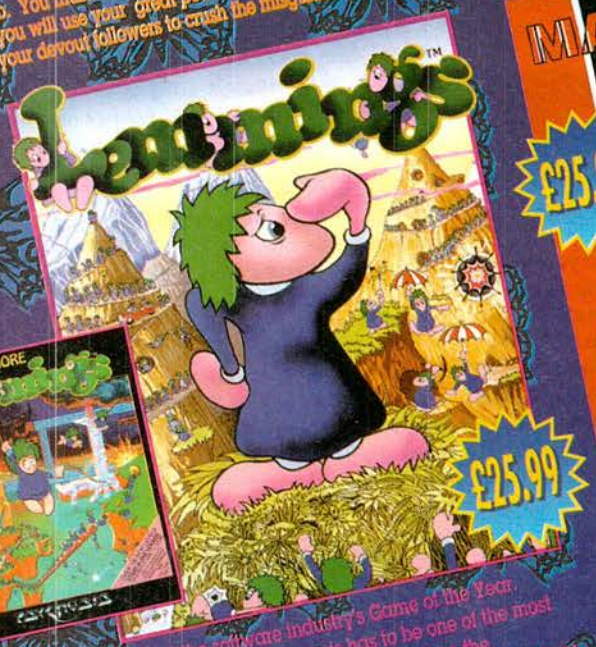
THE BEST CONVER



As a Divine Being you have a group of followers from whom you derive your power. The more followers you have and the greater their achievements, the more power you wield. Unfortunately, there is another group of people who follow a different deity. Since there's barely enough room in the world for your own magnificence, two won't do. You must rid the world of the opposition. To do this, you will use your great power to move the earth and your devout followers to crush the misguided.

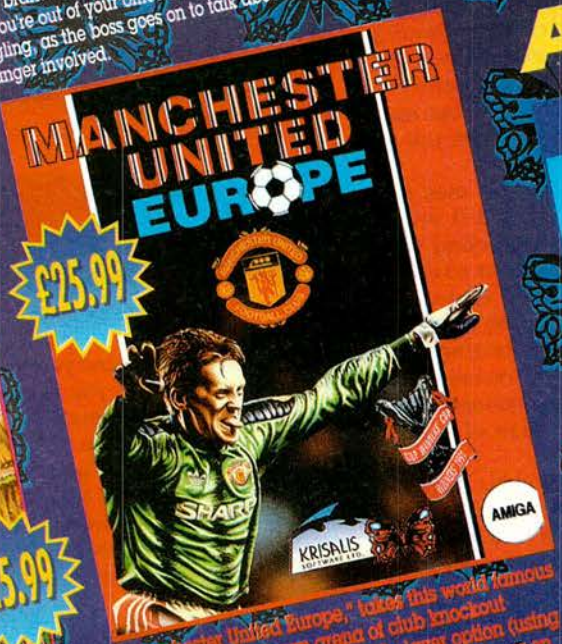
Down on the planet Nebulus all is not well. Someone or something has been building giant towers in the sea and they didn't even apply for planning permission. In the offices of Destructo Inc. you awake from your afternoon nap with the phone ringing, the boss is shouting about some little destruction job he's got for you and mentions the brand new Mk.7 Mini-Sub and the words "pay rise". You're out of your office in a flash, leaving the phone dangling, as the boss goes on to talk about the extreme danger involved.

Choose between a helicopter gunship or an armou jeep and prepare to enter enemy territory as part of the elite assault team of SPECIAL WEAPONS INTERDICTION VEHICLES. Battle against enemy 'copters, tanks, submarines, hovercraft, snowmobiles, mechanised flying fish, giant weapons installations and much more in this vertically shoot 'em up.



Oh No! More Lemmings 100 new levels of suicidal silliness. But you will need a copy of the original Lemmings to play Oh No! More Lemmings.

Voted the software industry's Game of the Year, 'Lemmings' by Psygnosis has to be one of the most playable games ever to be released on the unsuspecting public. 'Lemmings' the full title of 1991 now available from Krisalis for the Archimedes and BBC A3000.



"Manchester United Europe," takes this world famous club into the European arena of club knockout competitions. Game features:- 2 player option (using joystick) full goalkeeper control, name of player on the ball, new control method incorporating one touch football and offtouch, animated substitutions, yellow and red cards, sending off, action replays, 170 club badges, penalty shoot outs, Arcade only option, Management only option or full simulation option.

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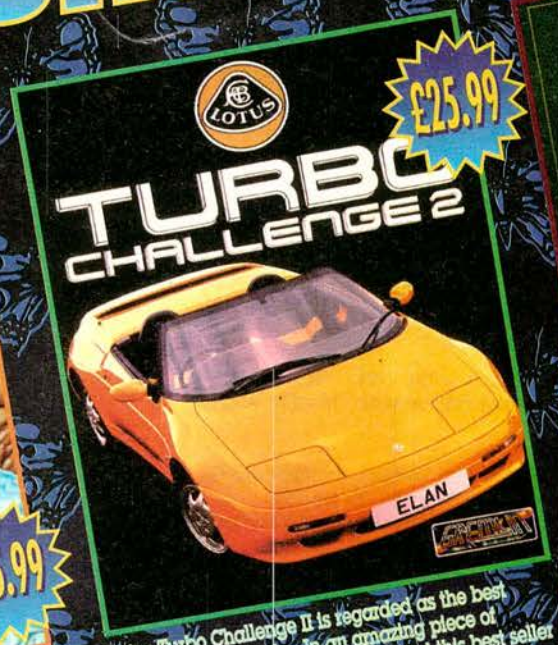
Krisalis Software Ltd

TH

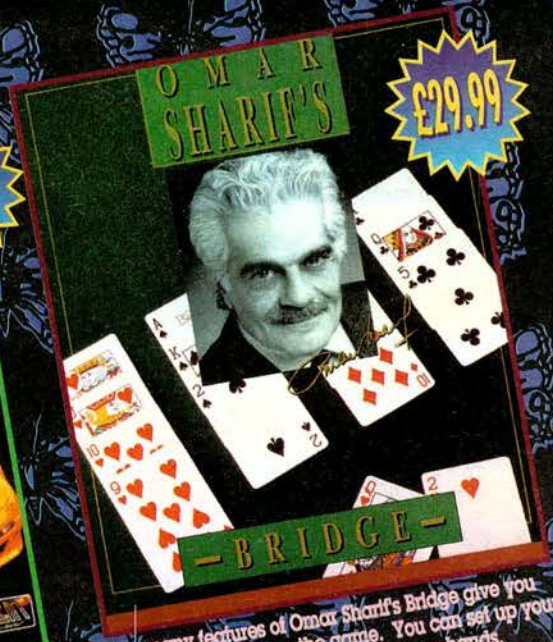
MASONS YARD DOWNS RO

SIONS...

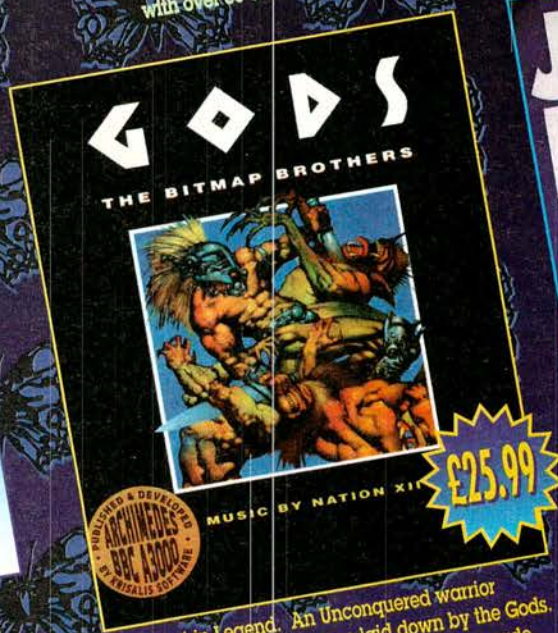
From the moment you watch "Chuck Rock's" introduction sequence you know that this product is going to be a bit special. This is why "Chuck Rock" has been licensed by both Sega and Nintendo publishers. All of Core Design's Amiga originality has been retained including the parallax scroll.



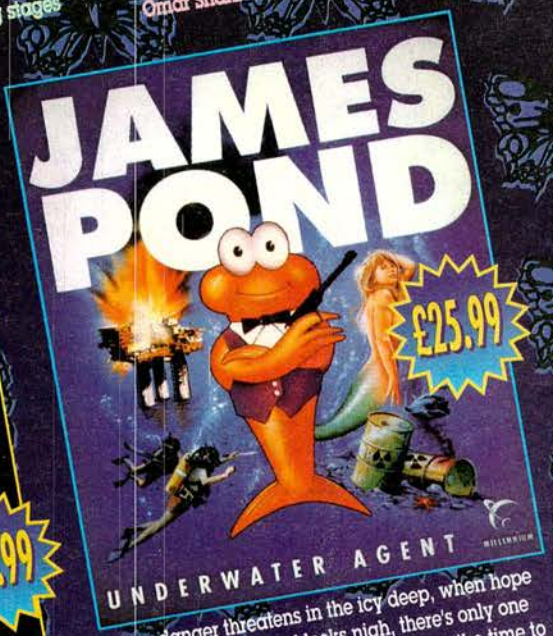
Lotus Turbo Challenge II is regarded as the best driving game to date. In an amazing piece of programming Krisalis have converted this best seller for the Acorn Archimedes and compatible computers. ▪ One or two player options. ▪ Hair raising hazards, rain, fog, snow, commuter traffic, tunnels and bridges. ▪ The opportunity to race a sleek Turbo Esprit or the stylish Elan soft top. ▪ 8 death defying stages with over 60 checkpoints.



The many features of Omar Sharif's Bridge give you complete control over the game. You can set up your own hands to practice slams, no trump hands, defensive play, or work on specific weaknesses of your game. Explore alternative lines of play with 'Take Back' and 'Rebid' features. With the on-disc tutorial, Omar Sharif's Bridge is the perfect way to learn to play the world's greatest card game... with Omar Sharif as your own personal tutor.



A city lost in Legend. An Unconquered warrior seeking reward. A challenge laid down by the Gods. Taking the role of Hercules, in the ultimate arcade adventure, you must scour the depths of an ancient city in your search for the great prize of immortality.



When danger threatens in the icy deep, when hope seems lost and the end looks nigh, there's only one fish with the guts to save the day. Now's the time to call James Pond - underwater agent. He's fearless, he's clever, he's Ozone friendly. James Pond, the fish with a mission (twelve missions, in fact), will take on anything.

32 BIT

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Spheres of Chaos

...asteroids revisited

THE first time I loaded Spheres of Chaos I panicked. Not because of the huge spheres on screen which transformed into smaller more numerous lumps of rock when shot. Not just because when you get the hang of that, alien ships starting firing at you too. But because the desktop wraps and scrolls as it loads the title screen. Beautiful especially as the press of a key takes you back.

The basic principle is to survive when every other ship, sphere belt and dubious being has decided to take a detour into your sector to give you a bad time. They are the minions of chaos and you are fighting a losing battle – or are you?

Matt Black recommends the mouse for control though there is keyboard and joystick support. I actually found the keyboard easier, but this is a personal choice.

PRODUCT SPOTLIGHT

Price: £24.99
Supplier: Matt Black, PO Box 42, Peterborough, Cambridgeshire PE1 2TZ.
Tel: 0733 315439

Regardless of the control medium you can rotate your ship left and right, thrust forward and hyperspace jump – I found the last very disconcerting to start with but soon realised just what a life saver it can be. Mind you it still didn't stop me jumping straight out of the frying pan and into the fire – literally – of another ship.

The more you shoot, the higher your score and as every 100,000 points gives you another life/ship you'll need all the help you can get. This comes in the form of coloured triangles containing extra powers and bonuses.

Simple in design with beautifully drawn graphics, smooth movement and a good use of sound, it's a very nice piece of programming. A variant on the original Asteroids it has solid graphics, fast animation and some really lovely. Everything you destroy explodes into thousands of twinkling particles that spread across the screen – it's even more colourful when your ship explodes into hundreds and thousands.

Spheres of Chaos also wins on the control allowed over the options. For a start, up to four players can battle together or against one another and if they all want joysticks Chaos supports the Magnetic Image (0603 402819) four joystick interface.

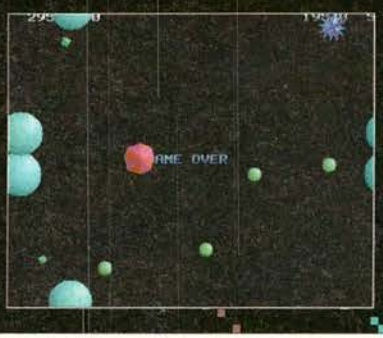
But to introduce yourself gradually to the technicalities you can control the quantity of spheres, frequency of rockets, mine layers, attractors, bugs and black holes. Plus you can have objects wrapping around the screen or bouncing off the edges (horizontal, vertical or both), you can affect vertical gravity strength and modify the response of your controls.

There is a pause option and also a stop flicker switch. I was told this was to overcome a potential problem on some early machines as the 310. Mine was quite happy, there was no flicker. The ARM3 and ARM250 machines do run the game a bit faster and this improves the excellent graphics still further with the gameplay remaining constant.

After some time of frantically shooting everything in sight, I began to work out a strategy and the principles behind the intelligent enemy, some of which can subdivide or call for reinforcements and even plant bombs – as if they needed to.

Though you can play Spheres of Chaos on your own – with a little judicious editing of the options – you get more from playing with friends. The motto of this game must be the more the merrier, but whether this refers to people or chaos I'll leave up to you to decide.

Teri Paul



> Everything you destroy explodes into thousands of twinkling particles that spread across the screen

Cyborg

...half man, half machine

PRODUCT SPOTLIGHT

Price: £25.95
Supplier: Alpine Software, PO Box 25, Portadown, Craigavon BT63 5UT.
Tel: 0762 342510
Requirements: 2Mb ram

CYBORG is one of those rare products – an arcade game with sections that are illustrated adventures – or you could call it an adventure game with arcade sections.

The story line is set in the far future. After answering a distress call from the planet Arallax IV, your spaceship is hit by a laser blast that destroys the Xylenium crystals which are its power source.

A quick scan reveals a number of possible sources of more crystals but the power fades before you can pinpoint the exact locations.

You pop on your GalCorp cybertronic suit and pop out into an alien world.

There are eight levels in all and each arcade level is followed by an adventure one. In order to qualify for entry to a competition, each must be completed in the correct order. This, I can assure you, will be no picnic.

You start off in an area designated The Desert where, in a horizontally scrolling scenario, you first have to destroy aliens riding scooters.

No problem, except that some enemy artillery is taking pot shots at you. Running out of energy or oxygen is fatal, naturally, so it is vital that you pick up the energy packs dropped when you destroy certain of the enemy units.

If you survive this assault, you'll discover that all the scooters become airborne and have the nerve to fire back. Also, in this level, there will come a point when you must work out who is and who isn't hostile.

At the very end of this section is something of a classic in all arcade games – a big bad beastie – and he's not there to wish you well. Indeed he needs dropping on from a great height.

Level 2 is the Caverns adventure area. This features the standard ALPS mouse icon control panel for most actions as well as permitting keyboard input. The interpreter allows for fairly complex instructions of the kind we now take for granted.

Many locations are well illustrated and this section operates like a perfectly standard adventure game as you explore locations, examine objects and work out how to manipulate them. If you do it all properly you can acquire a second power crystal.

The third level sees you back in an arcade setting but in the Forest where pesky flies persist in annoying you. If you deal with them all, their Mum turns up and turns out to be a much harder proposition. If you succeed, though, she provides you with yet another weapon which is just as well – you've earned it.

Next come the bears who need to be given a sore head, followed by bats and you need to think how they operate in order to deal with them effectively. After them, pterodactyls laying lethal eggs turn up and last of all, there's a dragon.

The next adventure level takes you ultimately to the alien headquarters before you emerge to the arcade level called The Street. Here there are alien storm troopers as well as some very nasty guns, including one of the laser variety, a helicopter which means you no good at all and assorted robots. Very challenging level, I can assure you.

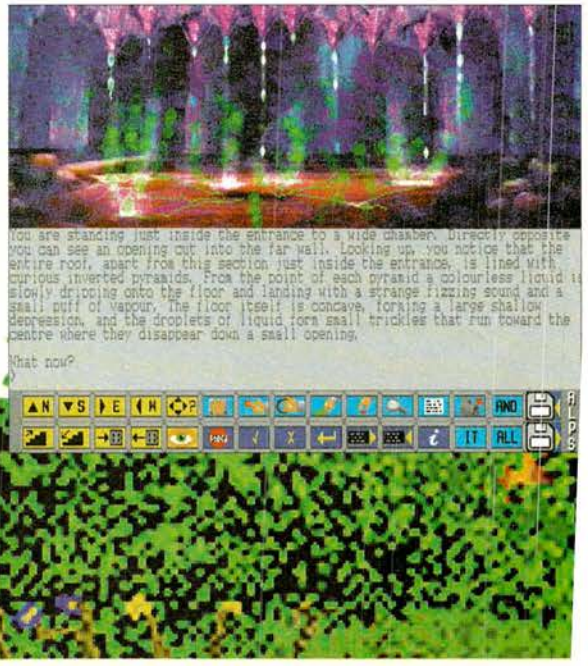
The game continues in this vein, and the alternative action was, to my mind, very satisfying. The graphics reminded me of Twin World and were good quality.

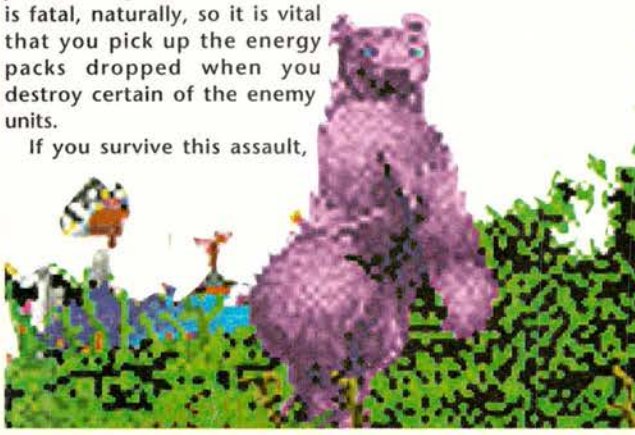
I am going close with some hints: In the arcade sections, perseverance and careful thought are preferable to mindless blasting. In the initial adventure section, it pays to have several baths in unlikely places but don't forget to set your Caps Lock.

A great game.

Mad Hatter

> Many locations are well illustrated and operate like a standard adventure game





Cyberzone

...futuristic RPG

AS well as adventures, I very much enjoy a good role playing game and Cyberzone fits neatly into this category. Set in the future, you are in a world of cyborgs, computer terminals and high-tech weapons. The Beta Corporation has taken over and now terrorises the place where you live.

Determined to change this, you decide to try and spread total confusion in the Beta Corp computer network. Aided discreetly by the anti-Beta Corp underground organisation of free people, you are rewarded for destroying enemy robots.

This enables you to upgrade your own cyborg or purchase better weapons and fighting programs to help you against the Beta Corp's Intrusion Counterattack Equipment which opposes you.

The primary task is to locate the equipment centres which will give you security passwords and the locations of data terminals which you need to access in order to achieve your object.

Movement of your cyborg is via the cursor keys: Typing in commands via the keyboard is also possible, but you need to be sure your Caps Lock key is on in order to be understood.

When you locate an equipment centre you can choose between the hardware and software shops or the Public Access Net which provides vital information on four data terminals. Valuable hardware includes weapons but you have to have an upgraded cyborg to access the best armaments.

The software shop gives you access to various fighting programs – the best of which is Superblock – on a similar basis. Important items of software are Positioner, Compass and Map: These names are self-explanatory and the programs will help you move through much more easily.

Everything has its price, hardware and software included, but beware the PAN which exerts a steady drain on your financial resources. The only way of replenishing these is to go baddie battering.

You will encounter lots of enemy cyborgs roaming around and you then have three choices: Fight, Flee, or Fraternise. Whatever you do, the first two options will cost you hit points, the last may well cost you money as well – it's a hard old world out there.

The playing screen is divided into two. The lower part is where input from the keyboard is displayed, and the upper part – itself divided into three – shows the view in front including any enemies, in the centre the model of cyborg you currently inhabit and on the right is a status screen telling you how disastrous life is.

Graphics are pretty good, though there could be more animation, and the sound is rather basic with a creaking noise indicating movement. Weapon fire is recorded and when you destroy an enemy there is a rather satisfying explosion.

Keyboard response is a little slow, so don't get too impatient when entering commands.

Recognition of enemy robots is a vital science if you are to survive your early forays. The simplest type to defeat looks just like one of the enemy robots from Battlestar Galactica or Darth Vader. It is worth 140 points to zap this one.

Worst to encounter is a cyborg that looks like a particle accelerator from A Maniac's Garden of Nightmares. This little sweetie will deduct around 25 per cent of your strength per caress, but it yields 2000 Credits if you can defeat it.

Cyberzone is somewhat reminiscent of Corporation in concept as a futuristically orientated RPG where robots rule. However, mapping is just as important in RPGs as in more straightforward adventures and, as always, I'm going to give a little help in the early moves.

A doorway is the entrance to an equipment centre and you'll not get very far without finding one of the four scattered throughout the area. Here are the moves to reach one from your initial position. Forward, Left, Forward, Right, Forward, Left, Forward, Right, Forward, Left, Forward twice, Left, Forward six times, Right, Forward seven – and there the door is.

In order to review this game, I have had to negotiate access to my Archimedes with my 15 year-old son, who rates it as highly addictive. That's a description I'm certainly not going to quarrel with.

Mad Hatter

> You will encounter lots of enemy cyborgs roaming around and you then have three choices

PRODUCT SPOTLIGHT

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John : Achievement Record 10/10 Mathematics (Number - AT2)

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Addition	2a.1	4a.4	3a.3	4a.6		2b.1
Subtraction		3a.4	2a.2	4a.5	2b.2	
Multiplication	4a.2	3b.1	5a.3	3b.2	7b.3	4a.14
Division	3c.2	4a.10	5a.4	7a.2	4d.4	
Fractions		6a.4			5b.1	8b.2
Decimals	6a.5		6a.9			
Percents	5b.2	6a.10	6a.8			
Estimation	8c.1			6b.1		3d.2
Units				3e.1	3e.3	5d.1
Powers					8a.1	5d.4

AT2 Level 4a.2 (i) Multiplication facts up to 10 x 10

The achievement record shows the subjects covered together with the child's progress: Red: Help needed Yellow: Practice needed, Green: 10 out of 10!

10 out of 10 MATHS (Number)

The Mathematics National Curriculum is split into five Attainment Targets. The Maths (Number) *10 out of 10* suite of programs is aimed to cover some essential parts of the Levels set out in Attainment Target 2. The package covers many topics from all Key Stages but the ten specific areas built into the design are listed below:

- Addition
- Subtraction
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- Decimals
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- Estimation
- Units
- Powers

Carnival: A great shoot-'em-up that checks number skills along with fire power. Various speeds challenge novice to arcade expert.

Grab It: Find and grab answers quickly in this fast-action game. It's a great way to practice number skills from tables to estimation.

The Big Bang: Keep cool and answer quick for high scores – an exercise in scale reading as well as arithmetic.

Cover Up: A challenging game to really get children thinking. It's a real game of strategy – especially in the multi-player modes.

Silicon Brain: A fun calculator practice game with key presses displayed on-screen to let you look back if answers are incorrect.

Cheers: A unique quiz game that will keep everyone on their toes. Use any of the six graded sets of questions or compile your own.

10 out of 10 ENGLISH

10 out of 10 English is designed around the National Curriculum for English and aims to reinforce the traditional values of the language. With its unique automatic assessment system the package covers many topics from all key stages but particular emphasis is placed on the following ten critical topics:

- Spelling
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- Verbs
- Adjectives
- Language use
- Punctuation
- Pairs
- Sound patterns
- Figures of speech

Sniper: A chance for children to prove they know – or learn – some common sayings as they shoot the target words.

Cover Up: Vocabulary and spelling are just two of the skills exercised in this challenging game of strategy.

WordFit: Crosswords, board games and word power combine as children fit the correct words in to the grid.

Grab It: Spelling, punctuation and many other important skills are practised and learnt in this fast-action game.

Librarian: Move the mouse fast and re-arrange the books! There's plenty of sorting and matching in this novel new game.

Cheers: The quiz game that children – and the rest of the family – can learn from as they move up and down the board.

FULL MARKS FOR TOP OF THE CLASS SOFTWARE

Extensive in-game Options

Not only can the educational level of the games be chosen, speed of play, game length and many other options can be set to tailor the programs to your child's skill level at the game. This means the games can be set to suit anyone from novice to arcade expert – it keeps interest longer and increases personal challenge.

Dual Scoring System

High percentages change the colours of the achievement chart while good gameplay – combined with high marks – give scores which are recorded on the high score tables. Both are automatically saved on disc so that children can keep returning to the package to improve on previous results.

Certificate Printing

Children with high marks c print a certificate of achieveme Text or graphic options are giv to suit a printer a *Triple Education* will print y a special c for a nomi charge.

Three Sets of Graphics

All the games have three sets of graphics to appeal to any age. These are automatically selected depending on grade – a parent/teacher override is provided so that you can select the pictures most suited to your child.

Unparalleled Quality and Attention to Detail

This package is the result of months of work by experienced programmers, educational designers, game designers, teachers, parents and children.

Two Guides

The player guide lets learning start quickly while the parent/teacher guide gives more details – including how to interpret the Attainment Target numbers.

Parent/Teacher Flexibility

Many of the automatic features of *10 out of 10* can be customised by parents or teachers – including sound off/on, the starting grade and the graphics to be used. A *Reveal* option lets you see the educational objective of the game being played at a glance. There's even an optional code system to prevent children altering stored information.

Ideal for ALL Ages Junior to GCSE

The fully flexible games all s with very simple ideas but develop to cover the more advanced topics. Adults will find the higher levels compulsive and a challenge too!

SIX Top Games

The games are designed with education of paramount importance but the fun and challenge elements ensure that children will want to strive for better results each time.

Designed for the National Curriculum with Traditional Educational Values in Mind

While ensuring that items like tables and spelling are well covered the package deals with many important subjects in the order recommended in the National Curriculum.

The *10 out of 10* Series is produced by *Triple R Education* 0742 780370

***10 out of 10* Maths (Number) and *10 out of 10* English are both available NOW for only £25.95 each.**

ORDER by mail or telephone: Access and Visa accepted. *Triple R Education, 1 Percy Street, Sheffield, S3 8AU, England.* **0742 7803**

"*10 out of 10* is unique ... a good resource for parents as well as good educational fun for children." – *The Micro User*

"... parents and teachers alike." – *Micro Computer*

PRODUCED by The Fourth Dimension .... THE 32-bit Acorn Games SPECIALISTS

Chopper Force

"Superfast Action-Packed Chopper Sim"

Superb 3D graphics, stunning sound effects and rivetting gameplay combine in this futuristic helicopter simulation. The Chopper Force is an elite band of police helicopter pilots set up to combat the modern terrorist.

ADVANCED HELICOPTER TECHNOLOGY

Gone are the old-fashioned dials and indicator LEDs of 20th century technology. Instead a sophisticated head-up display and a wide-screen monitor are provided. The monitor brings all relevant information straight to the attention of the pilot - saving the constant scanning of dials and indicators. The helicopter is equipped with powerful retro-rockets which when activated give it much of the power and speed of a jet. With the retros off the full manoeuvrability of the helicopter becomes available. Landing on skyscrapers and lifting equipment with a rope becomes possible.

RANKING SYSTEM

As you climb through the ranks extra equipment will become available. You will also gain privileges such as access to satellite surveillance. Ranking credits will be given for destroying any terrorists that are about when you do your mission as well as for achieving specific objectives.

Ranking debits are given for friendly-fire or civilian casualties that you may cause. To improve your rank you may redo a mission to try and get those terrorists that were missed the first time. Each player has his/her own personal file protected by a password that records what you have achieved so far.

LARGE MAP

The whole game takes place in one gigantic arena with a superb variety of buildings, roads, rivers and other objects. There are over 20 fascinating and varied missions that will test even the most experienced flight simulator fans.

STUNNING SOUND

A large variety of samples have been recorded at a high quality sample rate. The doppler effect is fully implemented just as it would really sound. The volume is correctly calculated using the inverse square law.

SUPERB GRAPHICS

More polygons than ever before are seen at a smooth frame rate. And yet the vector code is extremely flexible, allowing views from EVERY conceivable angle which is made use of with an impressive list of view/tracking facilities.

COMPETITION

Super prizes can be won by top scoring pilots.

For All Acorn 32-bit RISC Machines *Including all A3000s, A3010s, A3020s, A4000s, A5000s & all Archimedes Price £29.95*

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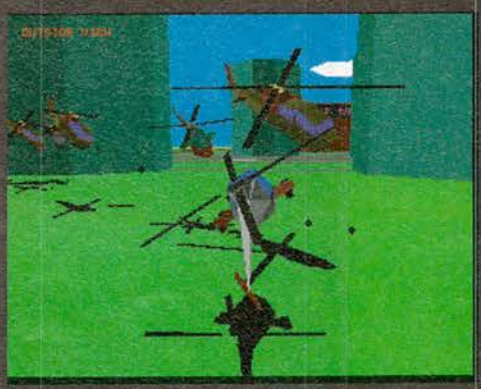
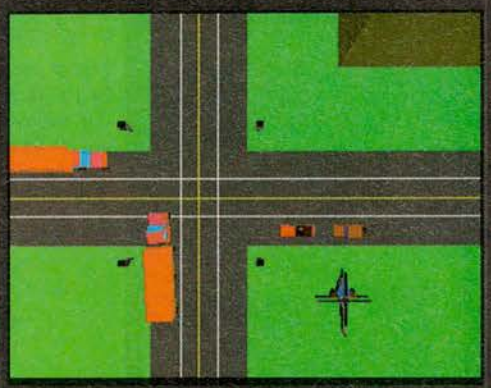
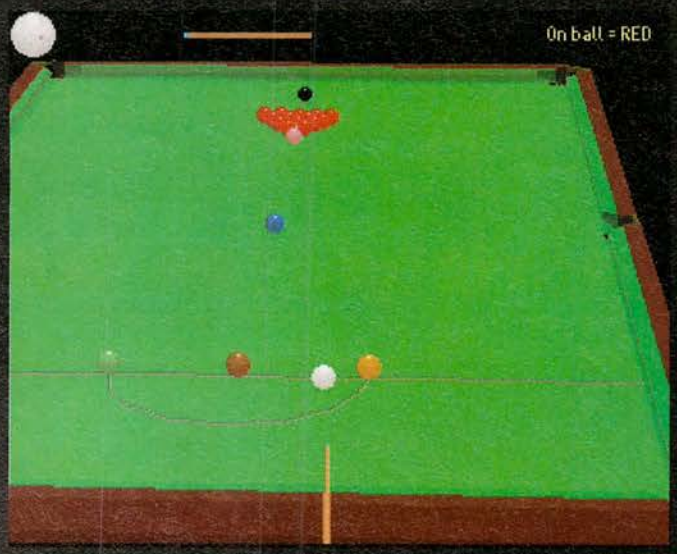
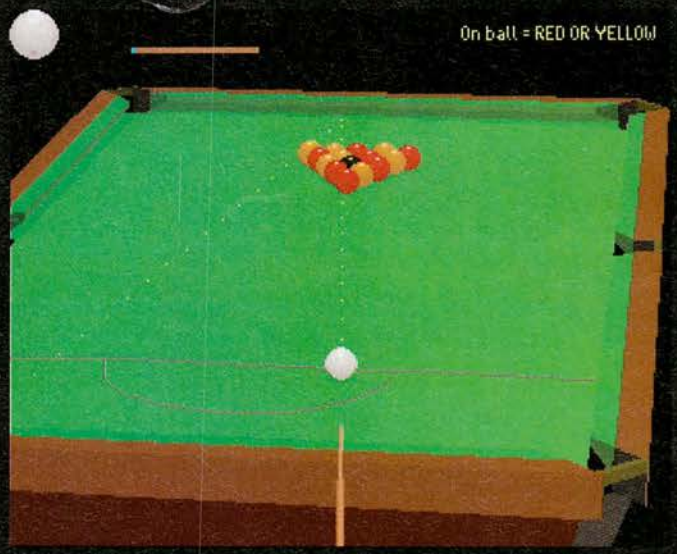




BBC A3000 / ARCHIMEDES / BBC A3000 / ARCHIMEDES / BBC A3000 / ARCHIMEDES

Break 147 & Superpool





"Snooker & Pool Simulator Par Excellence"

'BREAK 147' and 'SUPERPOOL' are game simulations in the true sense of the word. Gone are the power meters and fixed screw and side settings of inferior simulations and in comes a cue driven by reality software.

As in the real thing your grip on the butt of the cue (represented by the mouse), the smoothness and power of your cue action and the way in which you follow through with a shot, are all deciding factors in whether a pot is successful and whether you will retain position for the next ball. The only thing that is missing is the smokey air and a pint of beer on the edge of the table, these you will have to provide for yourself!

In both games you can choose to play on a practice table where anything goes. You can position balls wherever you wish so that you can improve your potting and positional play. You can even undo unsuccessful shots so that you can try them again. When you make that incredibly fine clip into a pocket or miss by the merest fraction, you can watch an action replay of the shot from any angle so that you can either gloat or see where you made that tiny mistake that let you down.

When you feel that you are up to the task you can play a single match against a friend or against one of the sixteen computer players. Should you feel lazy you can just sit and watch whilst two computer players battle it out between themselves. Alternatively you can enter a tournament where you will have to fight your way through the preliminary rounds and on to the coveted Final.

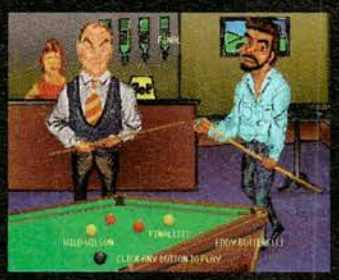
Whilst you are playing a match or in a tournament the game will be overseen by the referee. If in snooker you are 'on' a colour as in real life the referee will indicate the ball to you that he thinks you are going for and it is up to you to let him know if he is wrong. The referee will also call when a free ball is to be given, if there is a touching ball and your score after each successful shot.

SPECIFICATIONS

256 colour MODE 13 graphics optimized for maximum speed
225k of machine code
Over 147k of high quality sampled speech and sound effects
Ball plotting accuracy of +- 0.05 of an inch on a 12 foot table
Cue butt controlled by the Mouse
Bridge hand controlled by Keyboard

BBC A3000 & ARCHIMEDES PRICE £34.95

Break 147 & Superpool" is compatible with the BBC A3000 and ALL Archimedes computer



Reviews

"The graphics are so good that certain photos of the game being played could be mistaken for the real thing. The behaviour of the balls and cue are immaculately simulated." Acorn User, Nov '91.

"All aspects of the game are staggeringly realistic, from walking round the table and eyeing up the next shot, to the trajectories that the balls follow when they move....No longer is taking a shot an unconvincing experience comprising of aiming at the ball, selecting the power level, and hitting a key....The release of Break 147 & Superpool is a giant leap from anything ever seen on our screens, to what is arguably the most realistic snooker simulation ever to be found on a home computer." Club A3000, Autumn '91.

Reviews

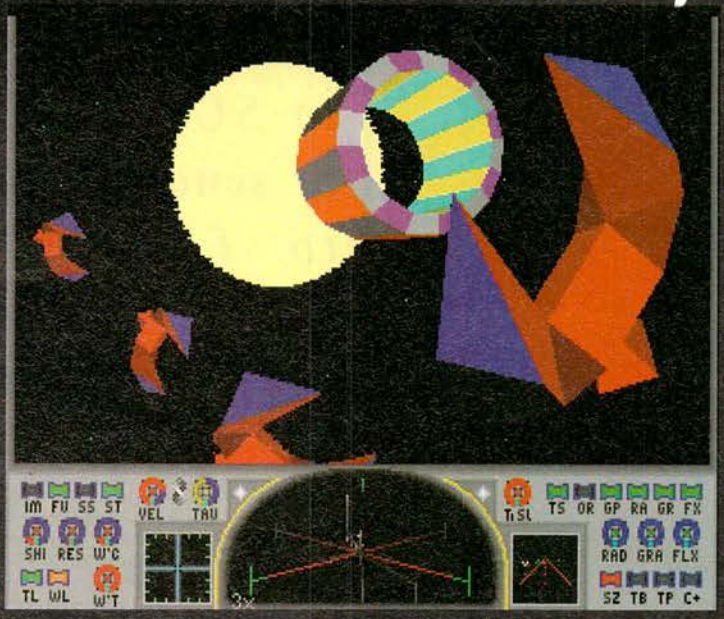
"Both Break 147 and Superpool are accurate simulations of the sport. The control method works well and the result is two very enjoyable games in one pack.... whether you are a snooker & pool fan or not Break 147 & Superpool are highly recommended." Archimedes World, Nov '91.

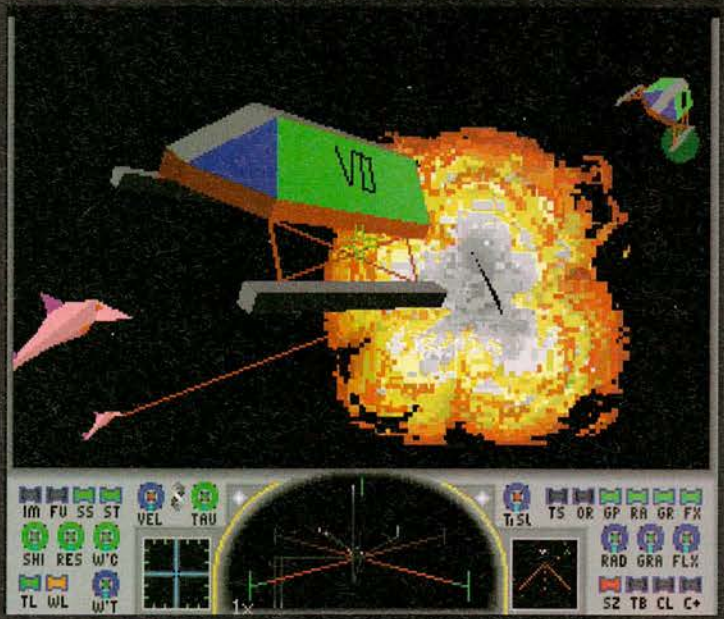
"The most realistic snooker sim I've ever seen." The Micro User, Nov '91.

"If you're a snooker or pool fan who wants a quality simulation for the computer then this is it.... In all, an excellent implementation of the game and I'm sure that due to the realistic 3D movement around the table, practice at Break 147 & Superpool may even improve your real game." Micronet, Sept '91.

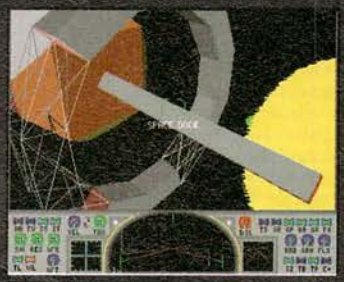
Gordon J. Key's
BLACK ANGEL

The Quest for the Key to The Gates of Carrion





A Huge Brand NEW Innovative 4D Adventure for the 1990s Brought to You by the Master of 32-bit 3D Programming



The Unique Quest for the Key

The Universe is old, very old, and your fourth generation galaxy is dying. **Chaos Rules With Ultimate Power**. There are no laws save those that nature imposes and any that you choose to impose upon yourself.

Evidence has been uncovered of an ancient civilization which may have inhabited a third generation galaxy. A civilization which seems to have beaten nature's limits of time and motion. A civilization which could travel faster than light. A civilization which may have outlived the death of its mother galaxy and which may even have had the power to leave the Universe itself.

Of course very few people believe what can be read in the five Billion year old religious scripts. They choose to believe that the Star Gates are a natural phenomenon, they choose to become extinct.

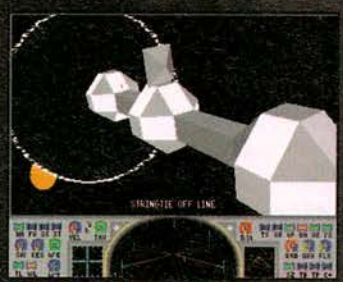
The objective of the game is to seek out and find the many parts to the key to the Star Gates, with which you should be able to escape from your dying galaxy to begin life again in a better place. This key, which is actually a huge computer program, has been split into a multitude of small pieces and hidden throughout the galaxy inside eight dimensional caskets. You have been given the clue to the location of the first of the caskets which lies in the star system of Atisco.

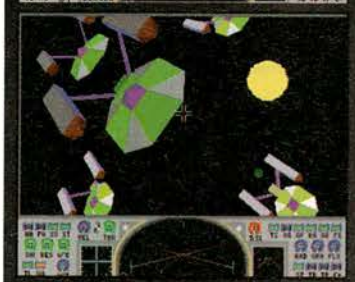
The Innovative 3D & 4D Reality

Black Angel represents a significant advance in graphics as used in computer games. Craft controls function correctly for ALL directions of movement and enable you to look and fire your weapons in any direction, regardless of the trajectory that your ship is following. The loss of control for certain directions of flight that occurs in the normal type of flight simulator/space game does not happen in this program.

In addition to this other craft that you will meet are not the simple convex surface triangles that you find in older inferior games, they are fully ordered multi-concave surface objects. It is thanks to the overwhelming power of the Acorn 32-bit RISC Technology that makes it possible to write the code to plot such objects in real time.

Also for the ultimate in reality, Black Angel is the first game to encompass the fourth dimension of Time. Your craft is subject to all the laws of relativity that a real craft would be. Of course scaled down so that it doesn't really take you several years of game playing to reach the nearest star!





For All Acorn 32-bit RISC Machines Price £34.95

Including all A3000s, A3010s, A3020s, A4000s, A5000s and all Archimedes

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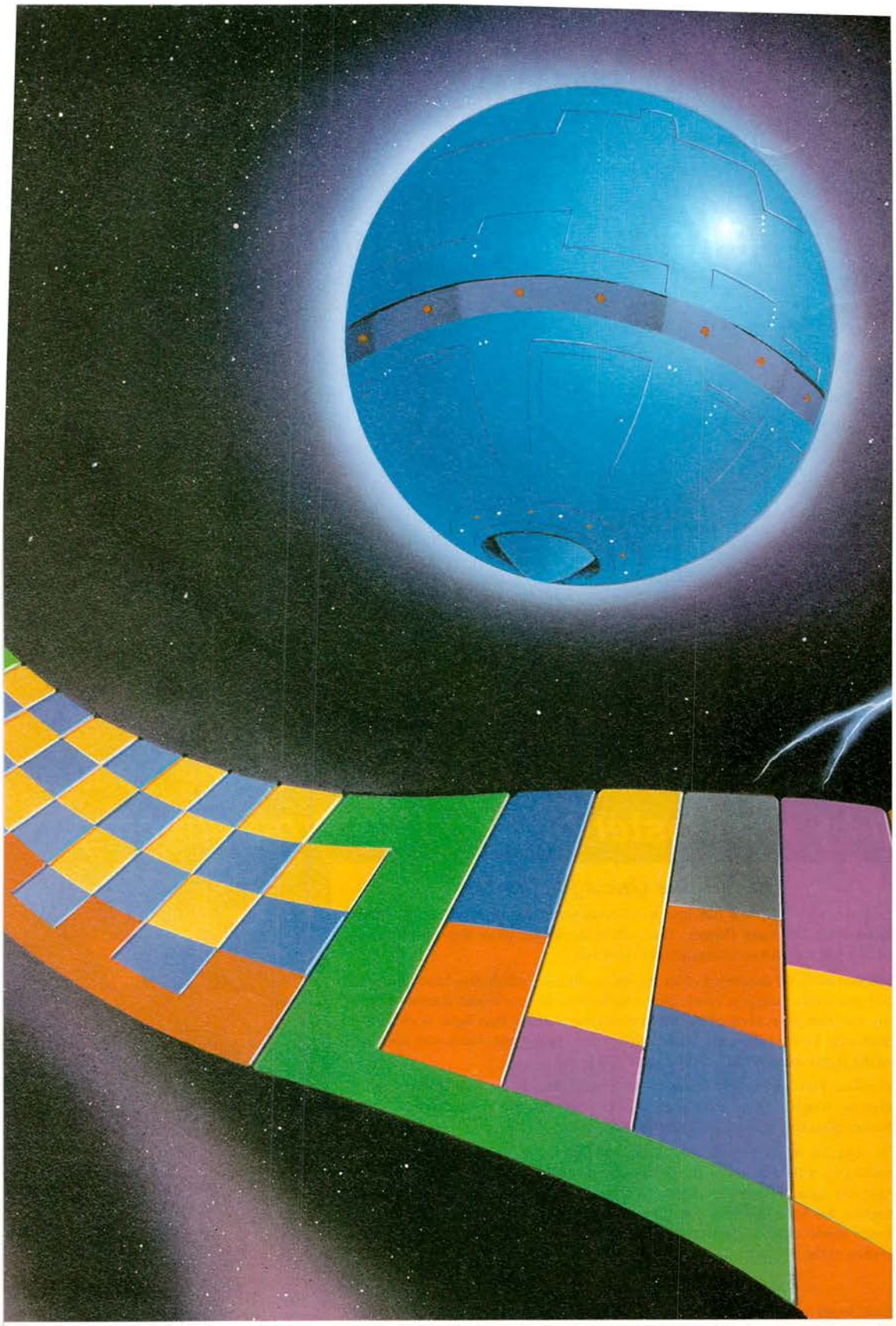

FERVOUR

"Professor

Our only way to SURVIVE – to send a droid to FERVOUR for the oxygen!

is it possible"

The year is 2100 and you, professor Skitz Patrick, are returning from a mission i search of a planet suitable for huma habitation. Earth is being destroyed b ecological disasters brought on by th human race. On returning to Earth yo are unable to make radio contact wit anyone. All radio frequencies are jamme with the following message which repea every minute, "Take shelter immediatel leave pets behind as they use valuab oxygen, and close your radioactive shelter..

After close observation of yo spacecraft readings you decide that son disaster has occurred since t temperature of Earth has ris dramatically. It occurs to you that it probably unsafe to return to Eart Unfortunately your supplies of oxyg aboard the spacecraft are limited. Thou unsuccessful on your mission for a plar suitable for human habitation, you d find a source of oxygen on the surface o planet named Fervour. You head ba towards Fervour.

The surface temperature of Fervour well over the range of your instrume thus making oxygen retrieval v difficult. After several days experimentation with oxygen retrieval have come up with a spherical droid w as few moving parts as possible. I impossible for you to get near Ferv because of the sheer heat, thus you m control your droid via a high freque microwave link.

Radiating out from Fervour there several thousand bands of varying p energy. Your droid uses this energ drive itself. Unfortunately, some a have excess energy and cause stra effects. Luckily, the frequencies radiation of the electromagnetic w radiated from these areas are within visible spectrum. This means that you able to see what areas of energy droid is over.

PRICE – £24.95 (inc VAT)

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Ixion

...back to the future

● *Living in a strange world*

IXION is the rather strange name given to this new release from Software 42. Basically, the idea of the game is to venture into the new and strange lands of futuristic Earth, solving puzzles as well as polishing off the enemies that inhabit this world.

Ixion can be run from hard disk or memory permitting, ram disk. I found this to be almost essential, as otherwise a great deal of time is spent swapping the two disks provided. It is always a shame when you have to rely on extra equipment in order to get the best from a game but unfortunately with this title that's how it is.

Once you begin, your view is through the eyes of your character looking at a 3-D scene with its associated buildings and objects. A control panel at the bottom of the screen provides all the information required to begin your quest, such as a map facility, inventory key and energy indicator.

Movement is also controlled from here and by using the mouse to click on the direction buttons, the view moves around accordingly. The 3D graphics add a wonderful sense of realism to the game.

Accompanied by an eerie tune, I began to explore and soon realised that not only is movement on foot quite slow but you run the risk of being hit by the enemies flying overhead in their space craft.

● *Not everyone is friendly*

Walking straight into a car that was conveniently placed very near the starting position, put me safely into the driving seat and ready to zoom around. Using the map facility, you can find the buildings marked with an arrow and venture inside.

Leaving the car outside I began to explore one of the buildings where you can search for objects and attempt to solve the many puzzles that are the key to the completion of Ixion.

The people that inhabit these buildings are both intelligent and aggressive. Some you can have conversations with, while others simply shoot on sight.

There are digitised pictures of the characters as well as their names but unfortunately not having picked up any objects on my travels meant that trading with the character was impossible as to establish any form of helpful conversation would definitely require some bartering.

Interrogating computer terminals will also allow access to more information. Other buildings reveal rooms such as a bar and a maze of corridors.

Back outside an enemy shot into sight, before I had even got one shot off, it bombarded me with gunfire. The characters seem to be quite intelligent and respond according to how well you treat them.

Pressing F12 allows you to quit back to the Desktop exactly as you left it, which I found extremely useful. Although the game does not run in a window, it is possible to leave and re-enter from the icon bar.

My only criticism was that moving around was sometimes very annoying, as clicking on the direction key would often take you sailing past the point that you wished to visit leaving you to smash into buildings and objects. Nevertheless, Ixion is a very playable game.

Brett Colley

> The characters seem to be quite intelligent and respond according to how well you treat them

PRODUCT SPOTLIGHT

Price: £25
Supplier: Software 42, 109 Ferry Road, Hullbridge, Essex SS5 6EI

Repton 4

...return of the hero

I'VE been around the world, through the seven ages and into infinity but there is still no escape – Repton is back in an all-new adventure designed by Superior founder Richard Hanson and games writer extraodinaire Gary Partis.

Who remembers Repton 2 on the BBC Micro? Well this classic arcade puzzle adventure had our little green hero with the usual falling blocks, monsters and tricks and traps, but he had to compile a puzzle at the same time.

Later, Clogger, from Impact Posters (the forerunner of 4th Dimension), made more of the puzzle factor but still on the BBC Micro.

Now gone are the falling blocks, but the diamonds and monsters – this time androids – remain, as an older and wiser Repton, called Ego, searches devious levels for nicely scanned 256 colour images of the rich and famous people and places.

Full marks to Superior for the difficulty ratings. The first five levels are reasonably easy to solve starting with a picture of the Mona Lisa. These pictures show the borders which is a help. The first 10 levels increase slowly in difficulty teaching you the devious little tricks you'll need later on.

Pressing H gives you access to the picture you are trying to create, while M gives you a map of the area. However, after 10 levels the help disappears and after 20 the map goes too. For the last 10 levels you are really on your own. Sound and music can be controlled and the levels are passworded.

You don't have to have played previous Reptons to appreciate the puzzles set for Ego. There are one way systems, mushrooms with much needed special effects and trees and towers which are not always what they seem. Even the seemingly treacherous holes can surprise you.

The androids will keep you on your toes and dexterous manipulation or a touch of lateral thinking should keep you sane. Oh, there's a time limit too.

Gems are scattered all around and you much collect them all before you finish the level. Others are hidden, and finding these gives you a bonus and a way on to the high score table.

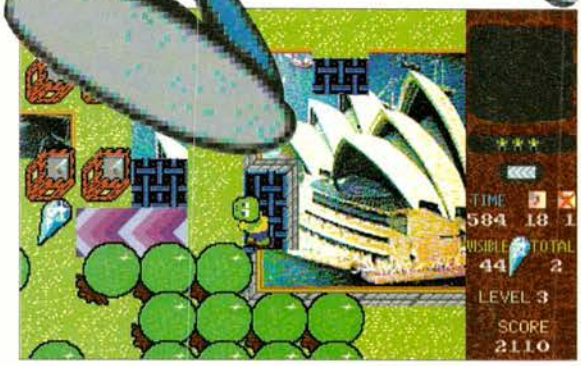
The central board is where you place the jigsaw but be careful not to box yourself in. If you find you have a piece you don't want to fit yet, there are individual board pieces placed around where you can drop the piece. You can only collect one piece at a time and the one you are carrying is shown in the window to the right of the screen. With some of the more difficult pieces you find yourself counting the pixels to find where it should be put. You can only put the piece in the right place and if you guess wrong too often and you'll lose one of your three lives. However, the odd hidden potion bottle can restore life if you can find one.

Just as you get the hang of this you'll come across a level with conveyer belts on the puzzle grid which makes it even more imperative that you place the pieces just so.

A bit of trivia to end. Amiga and Atari ST owners need no longer be deprived as a 16-bit version has been written for them. But Repton himself is only for the Acorn and on the other machines his place is being taken by an elephant and they only have 16 colours.

I like a good puzzle and Ego certainly gave me that. The sprites are large and well drawn and you can play with either keyboard or joystick. Repton 4 is challenging, good value for money and well graded. What more can I say?

Pam Turnbul



● *Rebuilding the Sydney Opera House*

● *Slide, Repton, slide!*

● *Looking for a piece of the Taj Mahal*

> You don't have to have played previous Reptons to appreciate the puzzles

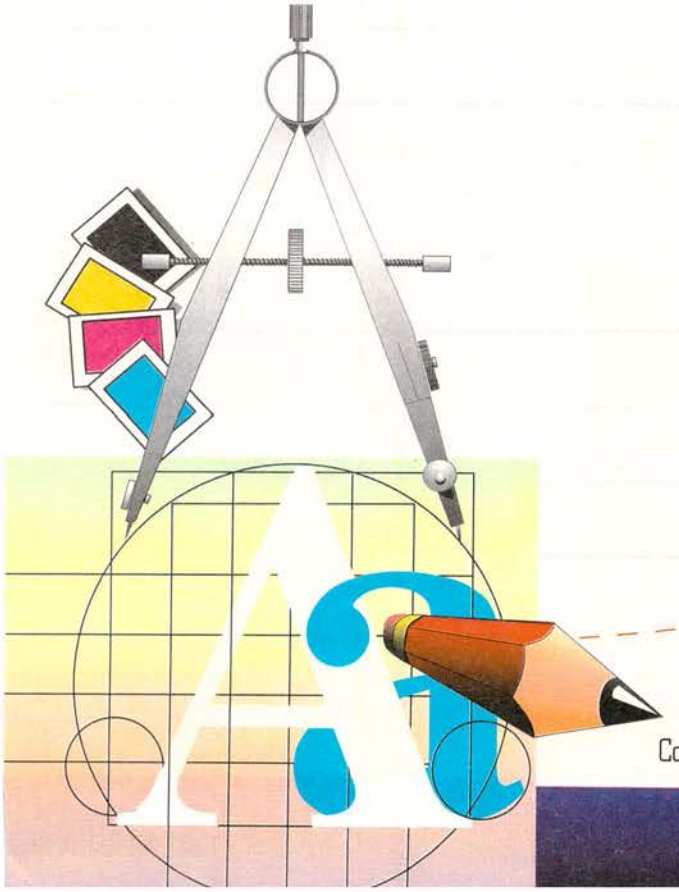
PRODUCT SPOTLIGHT

Price: £24.95
Supplier: Superior Software. PO Box 6, Brigg, South Humberside DN20 9NH.
Tel: 0652 658585

ARTWORKS BRINGS OUT THE ARTIST IN YOU

ArtWorks

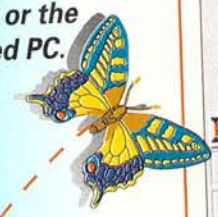
THE
GRAPHICS ILLUSTRATION PROGRAM
FOR THE
ARCHIMEDES



Computer Concepts Ltd

ArtWorks is an entirely new program designed specifically for the Archimedes range, that takes this computer into the competitive world of graphic design. An object orientated graphic illustration program, ArtWorks is intended to compete with the leading products on other machines - CorelDraw, Adobe Illustrator and Aldus Freehand.

The RISC technology of the Archimedes is ideally suited to applications where good graphics, and screen update speed are important. Comparisons indicate that on a A540, A5000 computer (or any machine with an ARM3), ArtWorks can redraw complex illustrations five or more times faster than either a Mac IIci or the fastest 486 based PC.

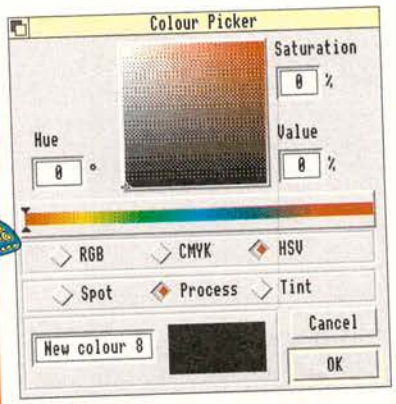


Speed and productivity

Speed of screen redraw and ease of use are paramount when it comes to making illustration programs productive, and a great deal of design effort has gone into this area. Based on feedback we have had from users working with prototype versions, we have succeeded in making the program faster and easier to use than other leading illustration programs. This means that is not only more fun to use, but it's also more productive, which means more time and money saved.

24-bit colour

ArtWorks uses a 24-bit colour representation throughout for all objects and offers three colour models for setting or selecting colours (RGB, HSV or CMYK) and three types of colour - full 24 bit process colour, spot colour and colour tints.



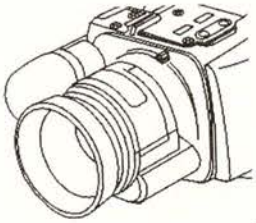
▲ *Illustration shows the HSV colour selector dialogue box*

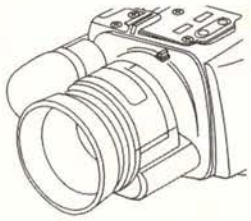
Comprehensive colour separation facilities are included with full support for spot colour and full, four colour, process separations. Under-colour removal and colour overprint control provide the professionals with the control needed to ensure the best possible reproduction.

ArtWorks uses advanced dithering to give the best possible on-screen representation when being used in 16 and 256 colour screen modes. Using a special palette in conjunction with the dithering even allows full spectrum colour work in 16 colour screen modes. The colour dithering works under RISC OS 2 and 3 and is more accurate than that available under the new RISC OS 3 operating system.

Anti-aliasing

To our knowledge ArtWorks is the only object orientated drawing program on any machine to offer real-time on screen anti-aliasing. This technique is used by Acorn's outline font system to enhance the screen image and remove screen 'jaggies'. This results in an apparent increase in screen resolution to more than double the actual screen resolution, and surprisingly this even works to good effect in 16 colour screen modes.





The advantages of anti-aliased fonts are well known to Archimedes owners, providing a more accurate and realistic display of the font. The same advantages apply to the anti-aliased drawings displayed in ArtWorks.

WYSIWYG

ArtWorks offers a completely variable choice between screen display accuracy and screen update speed. But rather than offering just two settings between 'outlines only' and best full colour screen rendering, ArtWorks offers a variable control. At the maximum setting it displays a full colour, fully shaded, anti-aliased display. Set the control down a little and the anti-aliasing is turned off, set it lower still and the colour shading is reduced, all the way down to a minimum setting where it displays outlines only.

Illustration shows info bar with the WYSIWYG knob on the right indicating a setting of 11

ArtWorks allows full editing of the illustration at any WYSIWYG setting, so you can choose between working on your drawing in full colour or just outlines, or anything in between.

Modular program

The ArtWorks program is made from a collection of individual modules and tools that integrate to form the complete package. This modular approach means the program is easily extendible, and customisable. For instance, new modules could be added in the future that bring enhanced or new features - it is not necessary to replace the whole program, and it is hoped that add-on modules will appear from both Computer Concepts and other software houses. For example, although ArtWorks is not a painting or photo-retouching program this functionality could be combined with all the existing ArtWorks features by purchasing an ArtWorks painting module.

On the other hand, if there are certain areas of ArtWorks that you find you do not need, these can be removed from the program, saving memory and disc space.

Info and tool bars

ArtWorks introduces the concept of two floating tool and information palettes. The main toolbar holds icons for each of the key drawing tools.

Illustration shows the expanded toolbar with the freehand tool selected

Each tool has an appropriate information bar that is usually displayed along the lower edge of the drawing.

Shows the info bar for the scale tool. Like most tools, the scale tool provides a comprehensive set of facilities accessible directly from the toolbar without having to use menus. On the example shown, the 3 by 3 arrangement of buttons controls the point around which the object is scaled. Using the mouse you can move the scale origin to any position, but the 9 preset buttons enable you to set the scale origin to any edge, corner, or the centre. The X and Y buttons flip the object about the X or Y axis.The Width button determines if line widths are to be scaled in proportion and the Lock button locks the aspect ratio of the scale.

The info bar displays information about the current tool settings and usually allows exact numeric values to be entered where appropriate. Most tools interact and can be controlled directly with the mouse, so you can perform the appropriate action directly on the drawing. As you do this the info bar continually updates its display providing exact numeric feedback as you drag.

ArtWorks therefore provides the best of both worlds - freeform, by eye, operations or precise numerically exact operations, making ArtWorks ideal for both technical drawing work, or purely illustrative artistic work.

Both the info bar and the toolbar can be positioned where required. The toolbar can be further customised by re-arranging the tool icons and allowing icons to be grouped to reduce the size and complexity of the bar.

Interactive tools

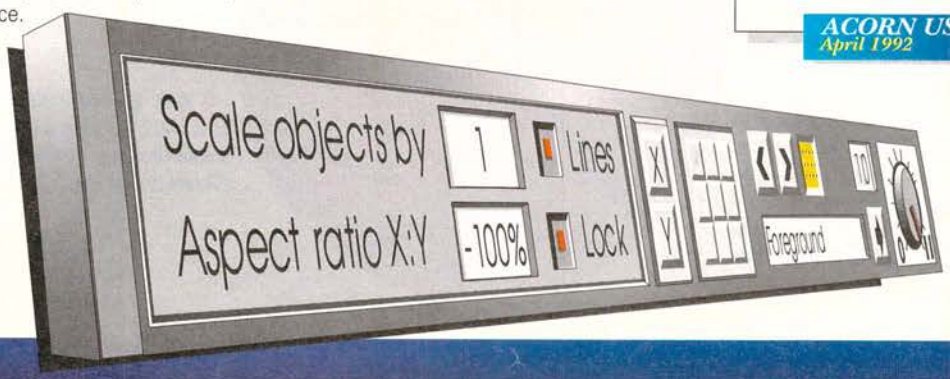
This feature makes a significant contribution to the productivity of ArtWorks. You can see the effect of the tool as you actually perform the act of dragging with the mouse. So, when moving objects around, you don't just see a meaningless square bounding box - you see the outline of the actual shape being dragged on screen. The same applies when you rotate or scale objects. The result is that there is no trial and error involved when performing these operations - the direct visual feedback allows you to position things on screen, absolutely accurately, first time.

page 2

Review

"..it forms what is perhaps the easiest to use, but most advanced graphic illustration package on any personal computer today"

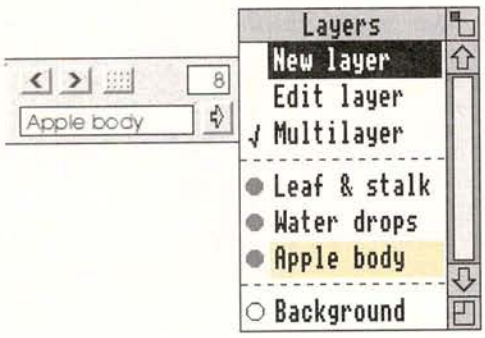
ACORN USER
April 1992



Layers

Vital for complex technical illustrations, but also useful for illustrative artwork is the ability to break complex drawings into any number of separate layers.

Each layer can be given any name and set to be displayed or not. The info bar always shows the current layer, and a pop-up menu controls all the layering features. The ordering of the layers can be altered.



The info bar shows the layer called "Apple body" is the current layer. This drawing has four layers in total, the background layer is switched off and the multi-layer mode is switched on so that all visible layers can be edited at the same time.

The layering facility makes it easy to work on certain aspects of the drawing without interfering with other parts. If, for example, a drawing is based on a scanned image, this image can be kept in a separate layer so that it takes no part in the editing process - so clicks over the image do not move the image, and a single menu click can turn the image layer off so it can't be seen. Another typical use of layers is in annotations of technical illustrations - the wording can be kept quite separate from the illustration itself.

Undo

One of the key differences between a drawing program, such as ArtWorks, and a painting program is that all operations in painting programs are permanent - just as with real paint. Once you've made an alteration to the painting, that's it. The only way you can change it or undo the change is to re-paint over the original again - just like real paint. As a consequence you need to have a high degree of confidence and artistic skill to be sure that the changes you make are going to be right.

With drawing programs each line or part of the drawing is a separate feature that can be changed, moved, or altered in any way at any time. This all boils down to one great advantage - experimentation. You can afford to try an idea on the drawing in the certain knowledge that if it doesn't look right you can remove the feature or undo the operation to restore the drawing.

Review

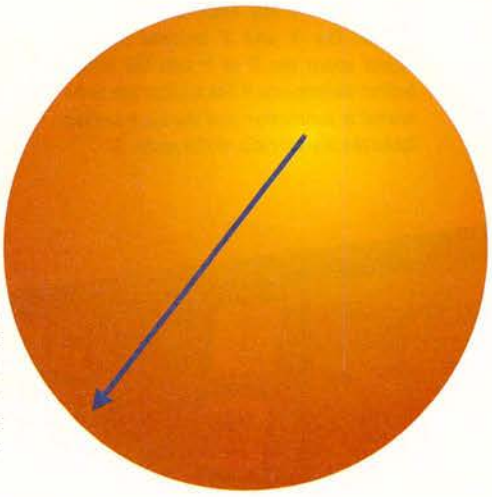
> ***"Working with full colour images in Corel is painful - it took seven times longer to create the same image that was used on the Archimedes, and that's a long time if you're constantly editing and changing your work"***
>
> **COMPUTER SHOPPER**
> **August 1992**

ArtWorks goes further than any other drawing program by recording not just the last step or operation, but as many previous steps as you require. You can make any series of alterations without worrying if it's going to be right in the end. If it's not, then just use the undo feature to retrace the steps back to any point in the drawing.

Also ArtWorks can store this record of steps, known as the undo record, with the drawing on file. So you can load a drawing and still decide that you didn't like the last changes you made and undo them.

We cannot claim you can produce artistic masterpieces first time, but ArtWorks does bring out the artist in you.

Graduated shading



With the radial fill tool one simple click and drag turns a hollow circle into a shaded ball, and straight linear graduated fills are just as easy.

One of the main aspects that distinguishes good looking illustrations from simple line drawings is high quality shading. ArtWorks has the simplest and fastest colour shading system of any drawing program.

If you want to fill a shape with a graduated colour shade using the colour shading tools, you simply click where you want the colour to start, drag in the direction you want the shade to be graduated, and let go. The object is instantly filled with a graduated shade going from one colour to another.

The Radial fill info bar shows the start and end colour of the shaded fill. Selecting an alternative colour from the current colour lists or creating an entirely new colour for either the start or end is instantly reflected in the drawing.

Unlike many drawing programs where graduated shading can only be simulated by overlaying dozens of slightly different coloured objects, ArtWorks graduated shades are stored in memory as one single object. The graduated colour fill is performed in a single rendering operation - ArtWorks can draw a graduated filled object faster than !Draw can fill a simple single colour object. It also uses the colour dithering system so that even in 16 colour screen modes you get a full spectrum of colours with colours smoothly and evenly changing from one colour into another.

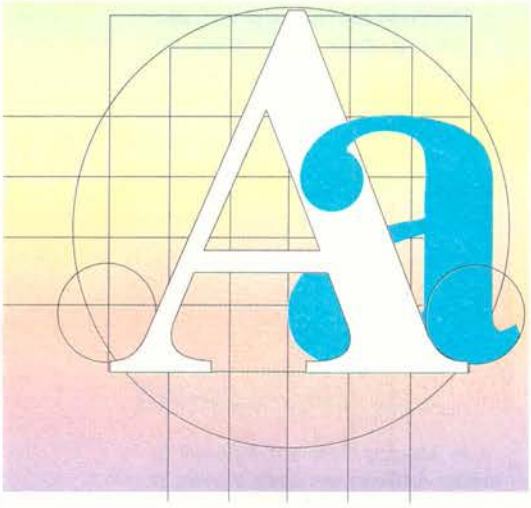
Graduated shading is simple, very fast, and requires very little memory.

Review

> ***"ArtWorks is set to make a very considerable impact on Archimedes users"***
>
> **COMPUTER SHOPPER**
> **May 1992**

Text

The ArtWorks text tool provides the ability to enter lines of text directly on the screen. A text objects behaves like all other objects in ArtWorks, so you can rotate it, give the characters a different outline colour, and draw a graduated shade across the text. But the unique aspect of ArtWorks is that the text remains editable text even after you have applied such effects. If you want to edit the actual character outlines, then a single menu option will change the text into editable curves and lines making it easy to customise the actual character shapes.



On top of this there is manual kerning, the ability to wrap text along a curve, and all these text handling features work on RISC OS2 as well as version 3.

Lines and curves

While ArtWorks drawing facilities are based on those of PostScript - it uses bezier lines and polygons - it tries not to get bound up in the normal PostScript jargon. You don't have to know what open bezier paths are, or what winding rule is used when filling. Basically ArtWorks supports two simple drawing primitives - lines and shapes. Shapes are solid filled objects and lines are, well, lines.

ArtWorks automatically fills any shape that is drawn to become a closed object.

▲ *Draw one side of a heart shape with the freehand tool.*

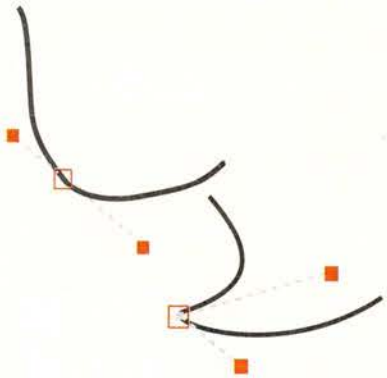
▲ *Draw the second half so it becomes a complete shape and ArtWorks will fill it in the current colour. Of course you don't have to fill it with any colour - it can be transparent.*

Review

> *"Many effects that would take a long time in Draw can be achieved in seconds with ArtWorks"*

ACORN USER
April 1992

The line and curve editing facilities are simple to use and extensive. You can select more than one point on a curve and delete or move them all at once. Lines can be converted to curves and vice versa. You can add new segments into curves simply by clicking on the curve, and you can change a curve from being a smooth curve into a corner 'cusp' point just by double clicking on the point.

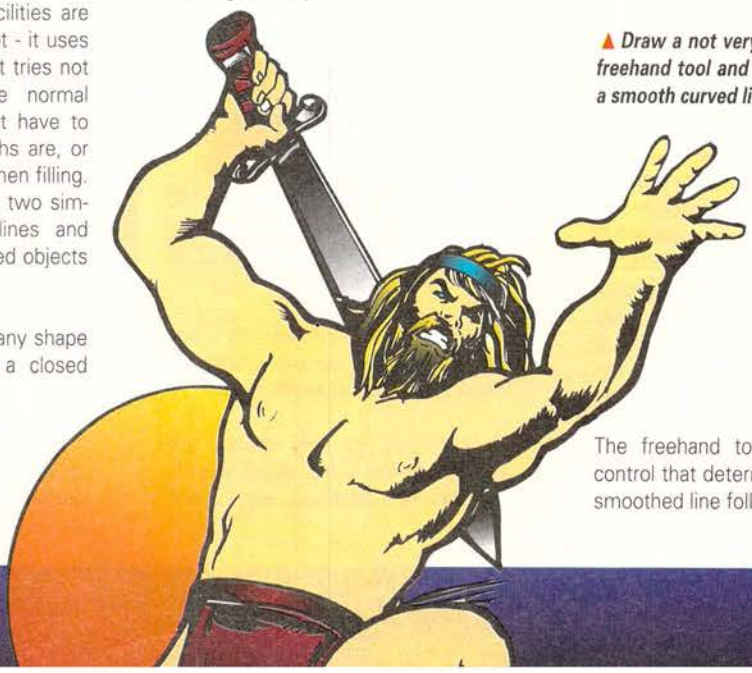


▲ *Simply double click on the control point and what was a smooth curve can be turned into a cusp or corner point.*

Freehand drawing tool

One of the criticisms of previous drawing tools is that they do not offer the immediacy or natural feel of real pens or pencils and paper. The fact that all lines have to be made from precise mathematical curves has meant that it was difficult and time consuming to draw lines with a natural freehand look. To overcome this ArtWorks has a special tool called the freehand drawing tool. With this you simply click and then draw with the mouse. When you stop, ArtWorks analyses all the mouse movements and calculates the best fit smooth curve to follow the original line.

▲ *Draw a not very smooth line with the freehand tool and ArtWorks turns it into a smooth curved line.*



The freehand tool has an accuracy control that determines how close the smoothed line follows the original.

Compatibility

In order to compete with products on the world stage, ArtWorks has been made to import and export files to and from the leading illustration packages on other systems. It can read and write files for CorelDraw 2 and 3 on the PC and from Illustrator and Freehand on the Mac.

Review

> *"Impression must be widely acknowledged as one of the most important pieces of software on the Archimedes. ArtWorks is going to be just as important"*
>
> COMPUTER SHOPPER
> MAY 1992

Under RISC OS 3 (or using an alternative PC disc reader) it couldn't be simpler. For example, you can be editing a CorelDraw file on your PC, save this to floppy, then load the file directly from this floppy into ArtWorks. Or vice versa, save an ArtWorks file directly to a PC floppy to be loaded straight into CorelDraw. Since Macs can now read PC discs it's not much more difficult transferring to or from that computer.

In order to guarantee compatibility with other Acorn applications, it can of course also read and write Acorn Draw files and will, if necessary, convert graduated fills and blends to multi-shaded polygons and export distorted text as outlines.

In addition to this some applications, such as Impression and Impression Junior, can display ArtWorks files directly, thereby benefiting from the superior speed and quality possible from the ArtWorks display system.

220 outline fonts

ArtWorks is compatible with all RISC OS outline fonts now available for the machine, but, in addition the package includes an incredible 220 high quality outline fonts - 200 of which are new to the Archimedes! These provide a huge range of styles and designs and because they are just normal Acorn outlines fonts they can be used by any other program such as Impression. (Typically the cost of obtaining this number of fonts would be more than the entire ArtWorks package.)

Dynamic blends

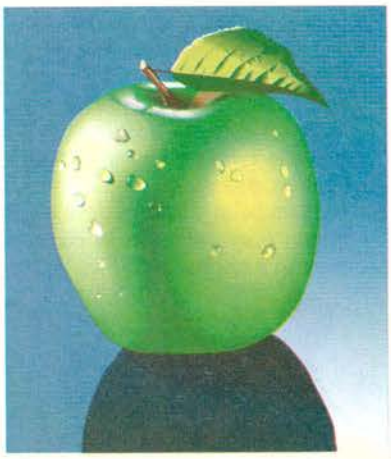
One of the most powerful tools in ArtWorks is the blend or 'in-betweening' tool. Starting with two different shapes this tool can create a series of intermediate shapes that gradually change from the start shape into the end one.

ArtWorks blends offer three important features not found in other programs. Firstly the blends can be between shapes that have differing numbers of curves and lines - in other words you can change from one shape into a completely different shape.

Review

> *"ArtWorks is turning out to be something special"*
>
> COMPUTER SHOPPER
> August 1992

Secondly, the blends are dynamic - all the intermediate steps are calculated and drawn on the fly, so that changing either the start or end shape will automatically re-create all the intermediate steps. Perhaps more importantly, the intermediate steps are not stored in memory so ArtWorks blend objects occupy a tiny fraction of the memory required by all other drawing programs. Indeed, a



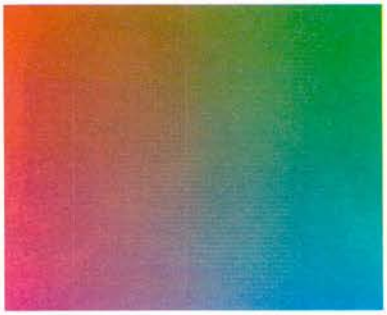
complex blend that is made from 100 intermediate steps would need only 1% of the memory required by other drawing programs.

Lastly; blends are not restricted to just two shapes. You can blend from one shape to another, to another, etc.

Since blends not only change the shape, but also other characteristics such as line thickness and colour, they can be used for very sophisticated colour shading effects.

In fact a blend can even blend from one object containing a graduated shade into another object containing another different graduated shade.

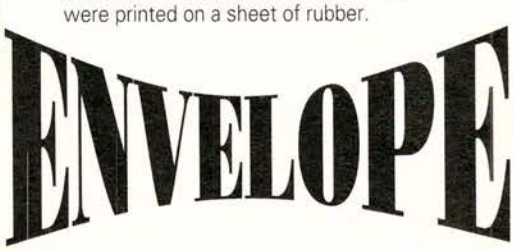
▲ ***This shows two rectangles, each with a graduated shade going across the rectangle.***



▲ ***By blending from one rectangle to another ArtWorks can create a series of intermediate rectangles, each with their own graduated fill. This simple example takes a few seconds to create and requires only a few hundred bytes of memory. In any other drawing program it could take many hours and would almost certainly require dozens of kilobytes of memory.***

Envelope

This tool provides a simple way to bend or distort objects, or any part of a drawing, in a simple and intuitive manner. In fact the objects can be distorted in a similar way as if they were printed on a sheet of rubber.



The enveloping tool is so fast it is almost instantaneous at distorting all but the most complex objects.

Perspective

Although the envelope tool can create perspective like effects by squashing parts of the shape, ArtWorks provides a tool that performs a true three dimensional transformation of any part of your drawing.

The perspective tool allows objects to be rotated into the distance and calculates and displays a true 3D projection. It can even show two vanishing points on screen which can be dragged around for the quickest and easiest way to manipulate objects in space.

Usability

There are dozens of other minor and not so minor features that help make ArtWorks a more usable and friendly graphics tool. For example, in ArtWorks you select objects by clicking directly on the object, rather than somewhere inside its rectangular and invisible bounding box. As a consequence, when you have a complicated drawing with dozens of overlapping objects you can select what you want directly, instantly, with no possibility of selecting the wrong item. Once you've experienced this feature it makes you wonder how you ever managed without it.

Printing

ArtWorks supports all RISC OS printer drivers, including the new Computer Concepts 24-bit colour drivers. It also fully supports PostScript printers providing control over screen angles and density. It can print to a Postscript file suitable for external imagesetting. ArtWorks can produce 4-colour (and any number of spot colour) separations on all printers (and can show separations on screen also).

Print tiling allows large prints to be made covering many sheets of paper. This works on all printers and each page is produced with co-ordinates for the tile position and precise trim marks. So now you can produce your own wall sized posters from a normal A4 printer.

Review

> ***"ArtWorks is quite simply the best vector drawing software on the Archimedes"***
>
> *COMPUTER SHOPPER May 1992*

Another invaluable feature is background redrawing. Even though ArtWorks can display drawings several times faster than other products, complex illustrations can take quite a few seconds to draw on screen. Normally this not only slows down the editing process, but also makes operations like scrolling the drawing to the correct position a very hit and miss affair. ArtWorks can perform screen update in the background - you can scroll or pan the screen as fast as you wish without having to wait for the drawing to catch up. The drawing is being displayed or re-displayed constantly as you move the document.

Multiple window views of any document. Each window may be at any scale and WYSIWYG setting, with a simple zoom in and out control allowing any portion of the drawing to be magnified by a simple click drag operation.

All secondary windows are always rendered in the background so you can carry on editing without having to wait for the display to complete.

Fully RISC OS 2 and 3 compatible, ArtWorks offers all the expected RISC OS support for printer drivers, in-memory transfer of drawings to other programs, support for any screen mode, multi-tasking etc etc.

These are just some of the dozens of points that make the difference between a program that is a frustrating experience to use and one that is a joy to use.

page 6

Conclusion

Illustration programs are a cornerstone requirement in many areas of computing, especially in publishing. The Archimedes range excels at desk-top-publishing, now with the release of ArtWorks, it excels in the area of drawing and illustration programs. If you want to draw anything, ArtWorks is the answer.

Sample illustrations

This specification was produced entirely using ArtWorks and Impression. The output was separated by ArtWorks and output to a high resolution imagesetter. All illustrations were produced in ArtWorks and illustrate some of the clip-art included with the package.

Review

"Having just purchased a 486 computer, no one is more disappointed than I to find that CorelDraw looks pretty pedestrian compared to ArtWorks on an Archimedes"

COMPUTER SHOPPER
August 1992

Screen redraw

ARCHIMEDES A5000	6.2 seconds
PC WINDOWS 3.1 486/50	36.3 seconds

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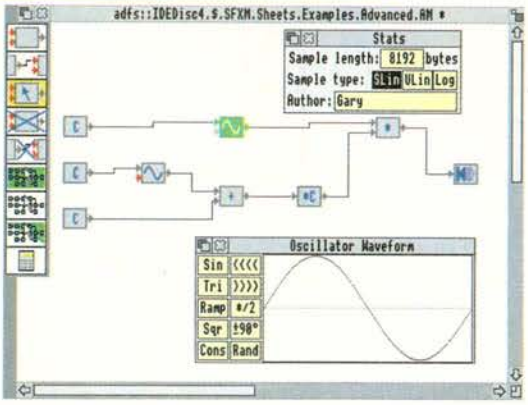

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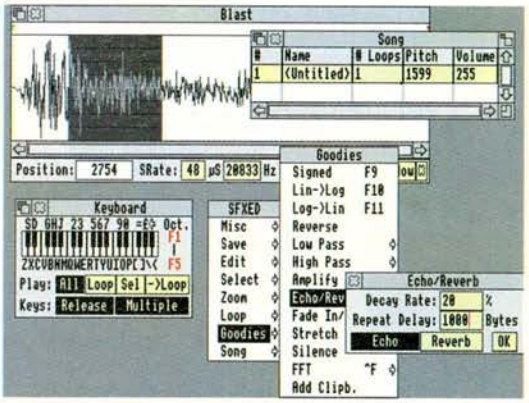

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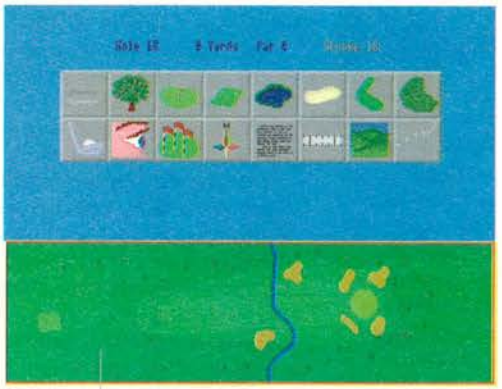

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Keeping

ONE of the most frequently requested – and expected – functions of a music program is the ability to print out a score. The Acorn 32-bit machine is fortunate in that many of its music program are notation-based – even the free Maestro.

However, it's one thing to be able to enter music in notation form and another to be able to print it out. Professional music scoring and printing is very complex. There are so many variables, signs and symbols to be taken into account and there's a right and a wrong way to position them all.

That's probably why the major scorewriting programs such as Finale – not, alas, available for the 32-bit machines – costs up to £700. But several less expensive programs can produce quite good and usable scores – we'll start with Maestro.

Ian Waugh is a professional musician and music teacher. Apart from composing music for many popular computer games on all types of machines he also writes for the top UK music and computer magazines.

He has written many books including *Making Music on the BBC Micro* and his work *Peace of Angels* was recently released on the Dawn Awakening label.

MAESTRO doesn't have a score printing facility. But if you're really on a tight budget you can produce printed scores with a little help from the built-in application programs, although it does require a little effort.

The basic procedure is to save pictures of the screen and dump them to a printer. But we can be a bit more creative than simply printing the entire screen.

The first step, however, is to dump the screen. You can save a lot of effort if you have a screen capture utility such as is available with Snippet which lets you select the area you want.

Otherwise you will have to manually select and isolate the screen area that you want to appear in your printout using the save screen option in !Paint.

If you're stuck for memory you'll have to use the command line Open your music file in Maestro and open the window to its full extent. Use a high resolution mode such as 16. Position the window in the middle of the screen, press F12 and enter:

```
*screensave
```

I use:

```
*screensave :4.pic1
```

which saves the screen to my hard drive. Scroll the music so the next set of bars are in the window and save the screen again. Carry on until you've saved all the bars.

There are several ways to isolate the area of screen you require. The method I used was to load the dump – which is saved as a sprite – into Paint. Click on Show tools from the Paint menu and select the scissors – Move block. Click on the Export option which appears at the bottom of the Toolbox.

Make sure that a directory window is showing, otherwise you'll have nowhere to save your cut to – although you could dump it back into !Paint. Drag a box around the area of the stave you want to use. A Save as box will appear. Name the sprite and drag it to a window to save it. Repeat for the other screens.

Make sure your selection doesn't include notes in the next bar and try to cut the area as close to the last bar line as you can.

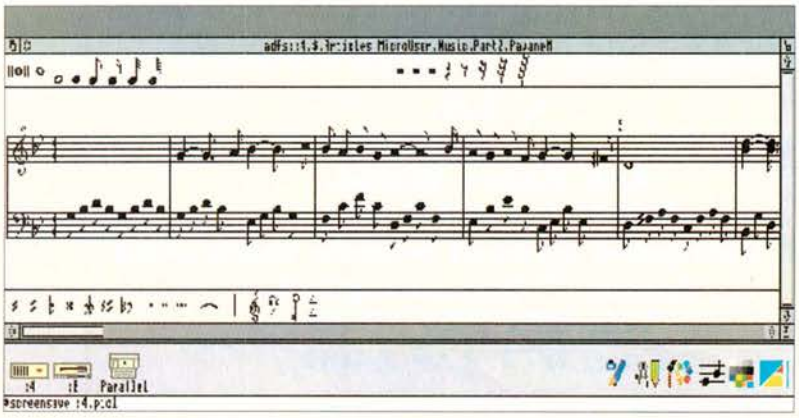
The next step is to create a page of music in Draw. Drag the first two sets of bars into a Draw window. You should be able to get two or even three sets of double staves on to a page but this will depend on factors such as the screen mode you are using.

The result will probably be a confused mess. However, Draw treats the two sprites as separate objects, so you can click on each one and move them around the window.

Use the text tool to enter a title, chord names and/or lyrics – this is rather low level scoring and the notes will not space out to accommodate lyrics.

To print, you must load a printer driver – the manual tells you how to do this – and then select the paper size and orientation from the Paper limits entry in Draw's Misc menu. Then select Print.

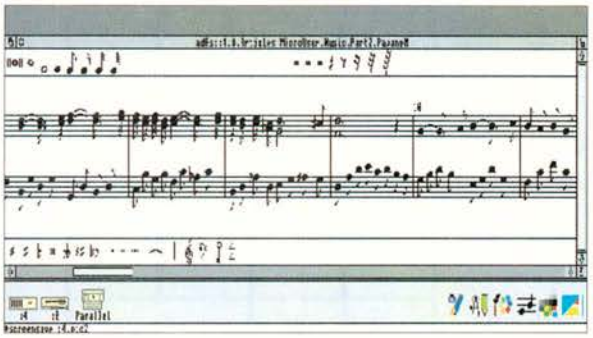
You'll undoubtedly notice several shortcomings, such as the lack of clefs and key signatures at the



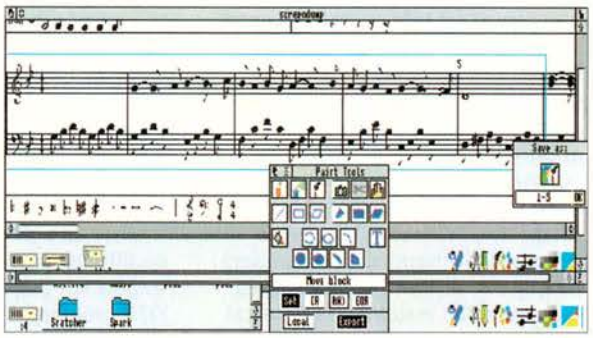
● *Using *Screensave to dump the screen containing the first five bars of Fauré's Pavane to disk ...*

he score

Ian Waugh takes you through the intricacies of score writing



...and bars 6-10



● Isolating and saving bars 1-5 in Paint ...

beginning of the second and subsequent sets of staves. However, you can if you wish insert these manually into the Maestro score so they do appear on the final screen assembled in Draw.

You may also find that the staves print with a grey background rather than a white one. You can remove this by setting the Mask in the Edit menu. Refer to the Paint instructions in your manual for further details.

Scoring with Rhapsody

Rhapsody, of course, has a built-in score routine. Select Format from the Score menu, choose your options and the program gives you a preview of the way the score will look. You print from this preview page.

The latest versions of Rhapsody have additional features in the Format window and optional Compression which reduces the size of the score by compressing it. I prefer to see more staves on the page, although this depends on the nature of the score, but you may think the result is too squashed, so Compression is what you need.

You can also set the page margins here and although most users will be happy with the defaults, you can alter them if you wish.

If printing is not occurring as you think it should, it's worth checking the printer settings, too. If you click Menu over the printer driver icon you can alter various options such as the paper size and margins. Click Select over the icon and click on the printer name to cycle through the types of printer the driver supports.

When in Rhapsody's Format window, you can alter the spacing of the bars by clicking Menu on the stave you wish to alter. If you click on Remove bar, the program pushes a bar on to the next stave. This has a run-on effect throughout the score. It's useful if you want to fill up the last line of a score so that it stretches right across the page.

The Print option from the Format window shows you more information about the printer driver, although you have to access the driver to make changes to the layout.

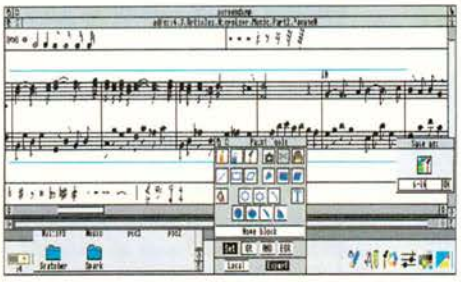
When you do print you'll notice several anomalies. For example, music instructions such as pp may print on top of the stave instead of below it. Look carefully and you will see that some of the beams overlap the note stems and some of the note stems protrude above the beams. This is a caused by the method Rhapsody uses to print music to the screen.

ScoreDraw production

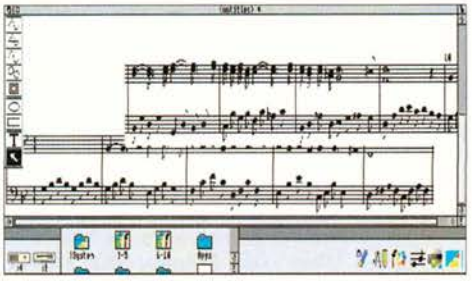
The solution is ScoreDraw. This is similar to the Draw application and, in fact, converts Rhapsody scores into Draw images. Rhapsody II has ➤

KEYNOTE

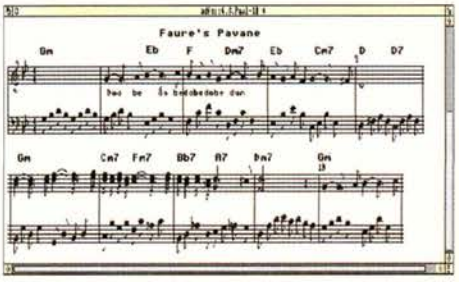
Screen redraws in ScoreDraw are slow, so get the formatting as near as you can in Rhapsody before transferring it to Score Draw.



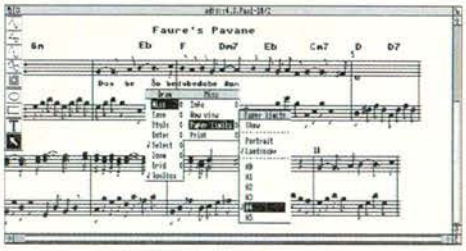
...and bars 6-10



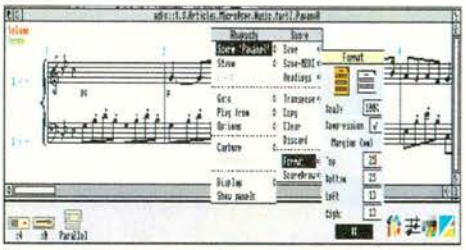
● The Draw window immediately after importing the two sets of bar sprites – confusing



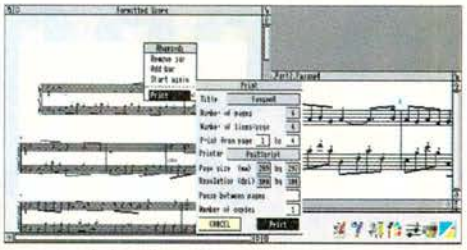
● The Draw window after tidying up and entering some text. That's better



● *Selecting the paper options in Draw*



● *Formatting a score in Rhapsody II...*



...and printing it

➤

hooks directly into ScoreDraw and you can select it from its own entry at the bottom of Rhapsody's Score menu. The two programs will interface invisibly if you have enough memory to run them both at once

ScoreDraw's printouts are far superior to those produced by Rhapsody. Whereas Rhapsody's output is bit-mapped and therefore blocky, ScoreDraw produces lined images which result in the musical equivalent of near-letter quality scores. The display of the score on screen sometimes contains thick stave lines but this doesn't affect the printing.

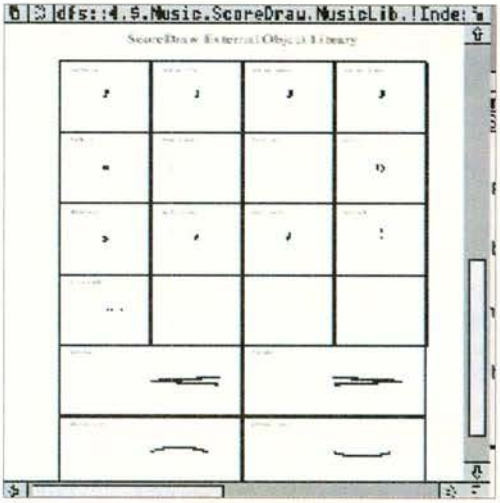
The program is supplied with a library containing several music symbols such as hairpins and bowing symbols which you can import and place on the score.

You can also design your own objects in Draw and use those, too. In fact you can edit the score in Draw although the transfer isn't entirely automatic. You may have to set certain scales and grid spacing in order to get the best results, although the ScoreDraw manual advises you on this.

With ScoreDraw's high quality output you could import the pages into a DTP program. You could use this to produce your own music books and teachers could produce music examples for class work. However, be careful not to break any copyright restrictions.

KEYNOTE

Rhapsody lets you define the length of staccato notes as a percentage, but you must add the staccato dot to every note you want to play that way.



● *Some of ScoreDraw's additional music symbols*

Other scorewriters

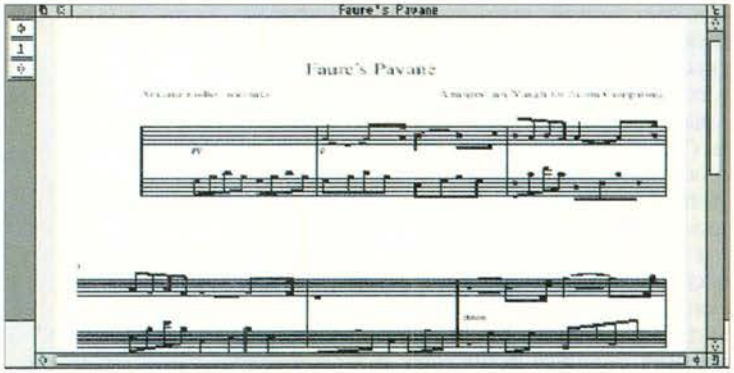
Other scorewriters are available for the 32-bit range, each with its own strengths and weaknesses. Longman's (0223 425558) Notate – reviewed in the February '92 issue of *The Micro User* – has slightly fewer facilities than Rhapsody, but it also uses sprite images which results in a chunky printout. It's aimed primarily at education and is easy to use.

EMR (0702 335747) has a suite of scorewriter programs called, naturally enough, Scorewriter PMS (Professional Music Scribe). There are two versions costing around £130 to 150 for use with dot matrix printers and a version for PostScript printers costing £400 to 500. These can be used with the latest version of EMR's Studio 24.

Whichever scorewriter you use there are a few points worth bearing in mind. The first, and the one most often overlooked by those who would like to play a piece at the piano and have a program convert it immediately into a score, is that we very rarely play music exactly as it is written. If you are creating a score primarily for printing you should be more concerned with how it looks rather than how it sounds.

This will not be a problem if you are entering a score directly on to the stave with the mouse, only if you are recording it live from a keyboard. In such cases it will help to play methodically and always use quantisation to pull the notes into line.

● *Next month we'll take a closer look at Midi and in particular at standard Midi files and how you can play them, not only from dedicated sequencers but from Rhapsody, too.*



● *Fauré's Pavane according to ScoreDraw*

Rhapsodic interlude

Rhapsody from Clares (0606 48511) is a more sophisticated version of Maestro. As well as supporting up to 24 staves, you can playback from any position. It also has a full range of accidentals, click and drag note insertion, real-time input from a Midi keyboard, note beaming, programmable trills and ornaments, text option for lyrics, five sizes of score display, and score printout.

Midi recording isn't as sophisticated as it might be but the program is an excellent step up from Maestro. It can read Maestro files, so you can take your existing tunes with you, as well as reading standard Midi files, which gives access to a wide range of pre-programmed music.

To load a Maestro file into Rhapsody you must make sure that you have assigned enough voices to each stave in Rhapsody. For example, if a stave plays three notes at any time, you must give that stave three voices. You do this in the Assign Stave Data window from the Reassign menu. The number of voices is shown in the box labelled ARC channels.

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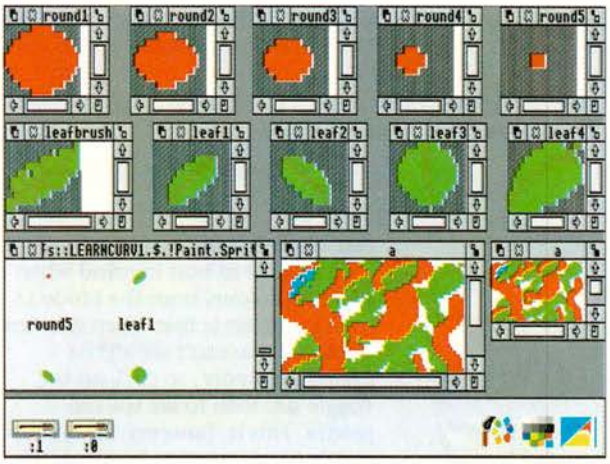


● *You need to create round brushes for good shaped leaves*

IN previous issues we have drawn trees using the *pencil* and copied them. We also covered creating your own brushes. Now we're going to create a few more brushes and use some of the features of !Paint that haven't been covered so far – the replace colour option and adjusting the size of the landscape.

Using the same techniques as in the last article I have produced a series of round brushes in different sizes for general painting. The jungle effect I produced can be seen at Zoom scale 2:1 and 1:1. Zoom is very useful where you need to produce fine detail.

One of the problems with working on a full screen sprite to produce your landscape is that as it fills more and more of the available screen area there becomes less and less room to try things out on or to copy from.

One way round this is to extend your screen to give yourself a working margin above and to the right of your landscape. This can be used as a scratchpad which can be chopped off your landscape by using the Adjust Size option under the Edit menu. Once you have this option you can either use the pairs of arrows to increase the size of the area or alter the numbers which size your working area in pixels.

When deleting the extra space be careful to only go as far as your original sprite screen size or you'll lose part of your picture.

And so to work. Having created a screen sprite of 618 x 234 pixels in Mode 15 I was faced with a black screen. This is a bit disconcerting, and the first thing to do was to replace the black with a faint grey/sky blue.

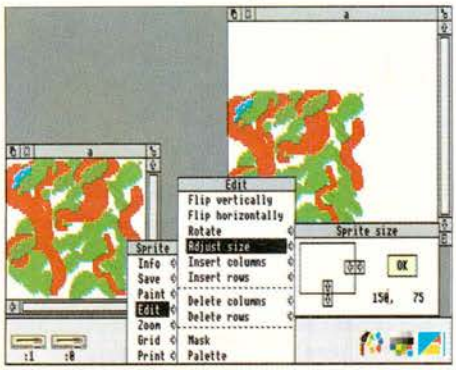
To change the black to colour 249 you need to select Show tools for the Sprite menu and select the icon of the grey paint bucket tipping out red paint. This is the Replace colour tool and can be used, as can all tools, with the Set, OR, AND and EOR options as well as the Local and Global options.

Local is selected when you only want to change a particular occurrence of one colour to another. Global is selected when you want to change ALL occurrences. For example, if you had drawn a landscape with lots of trees and there were hundreds of bits of sky between the branches you couldn't possibly change the colour of all the bits with the Local option, but you could with the Global option.

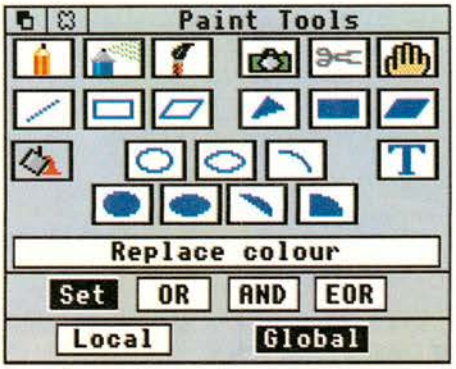
Step-by-step gardening

My landscape will be in three main horizontal layers – a retaining wall, the lawn and raised bed and the fence and trees at the back. There are houses overlooking my garden at the back but I want my picture to look as though I live in the countryside, so I'm being selective.

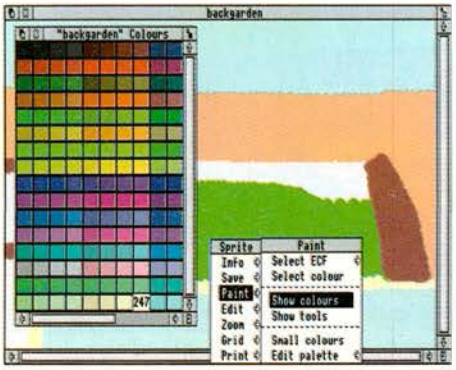
To use my large round brush I first selected the Use Sprite as Brush option and selected my brush by typing in ROUND1 on the Paint Tools menu and clicking OK. With the Shape option off, the brush paints in the colour used to create the brush, but if Shape is active it paints in any colour selected from the colours palette, which in my ➤



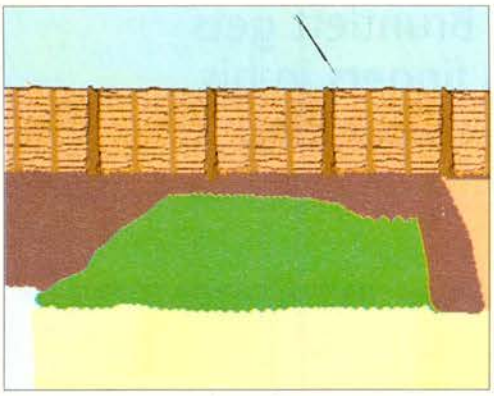
● *Adjusting the size can make life a lot easier*



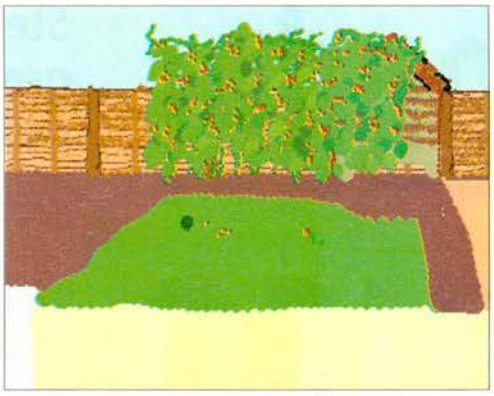
● *Local and global options – the choice is yours*



● *Selecting matched colours takes practice*



● *It's easy to erect a fence this way...*



... with extras such as a shed and runner beans

➤

case is a light buff.

One point to bear in mind when selecting colours from the Mode 15 colours palette is that when it is first displayed you can't see all the available colours , so click on the Toggle size icon to see the full palette. This is, however, absolutely massive and covers at least half the screen, so reduce it using the Adjust Size icon to manageable proportions. Use the Toggle Size icon to toggle between your chosen working size for the Colours palette and ts full size.

The first stage of my gardenscape was to rough in the main areas of garden, wall, path, fence and trees. Painting with a large brush can be very slow. A quicker way of dealing with large areas is to outline the area and fill it in the same colour.

However, if you're painting lots of different areas in the same colour it's not always easy to remember exactly which shade of grass you're using. To get round this click Menu with the pointer over the shade you're using and select the Select Colour option from the Paint submenu and !Paint will match the colour.

You can check the colour is correct by popping up the Colours palette where you'll see your matched colour with a rectangular white outline and the number superimposed on it in black.

Once the main areas were mapped out I started the part of the painting furthest away – the fence. I drew a single section and then copied it across the whole screen.

Working from the back, one layer on top of each other, works well, but it's a good idea to save after each period of work or after each layer is complete so that you can go back a stage. This means that you can experiment yet go back a stage if you make a mess of the dahlias.

The back of the garden hut was next and you can still see part of it behind the runner beans, which look more prolific than they actually were this year. Both the row of runner beans and the wonderful tomatoes in front of them were painted by the same method.

The sprite leaves were designed in two colours and were *painted* over the top of rough darker green foliage using the shape of the leaf. The colours of the original leaf sprites can't be changed unless they are redrawn, but by selecting Shape from the Tools menu the flat shape of the leaves can be used in any colour to reasonable effect.

The soil was textured in a few different browns as a basis for the plants in the borders. The grass was airbrushed over a flat base green with darker greens at the front and lighter, paler greens toward the back, hopefully giving an added effect of perspective otherwise only created by the layered look.

The wall at the front was sprayed in horizontal bands of buffs, browns and greys, divided into rough blocks with a greeny buff and then sprayed with the same colour to give a more weathered look. The wall seems to work well visually and the technique could perhaps be varied for different materials.

The path and bushes were drawn using texture to give some degree of layering and also to prevent everything looking flat and two dimensional. The flower beds at each side were drawn in roughly using the smallest round brush and a large plant at the right hand side was added to try and create more depth.

The large fennel plant is at least four feet high, but I don't think it works all that well as it's difficult to get enough variation in colour to separate out the layers of the picture. Perhaps I should have used fainter colours at the back.

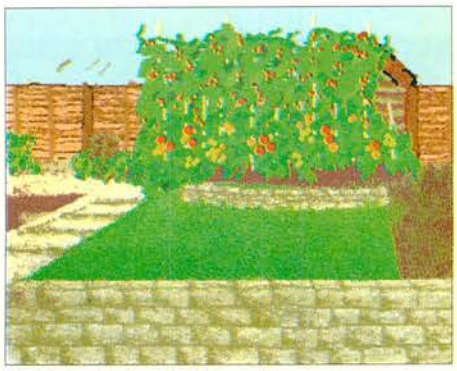
The last part of the gardenscape is the plants overhanging the wall. They don't actually overhang in my garden – they just lie there on the top – but artistic licence adds another touch of depth.

Finishing touches

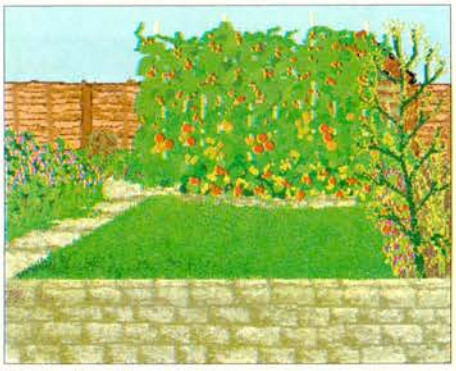
My gardenscape is very rough – as is my garden – but you should be able to come up with something a bit more detailed and subtle.

!Paint has taken a lot of criticism, but there is more to the program than people give credit for. However, there are better programs which allow things to be done quicker and simpler and we'll be touching on these later.

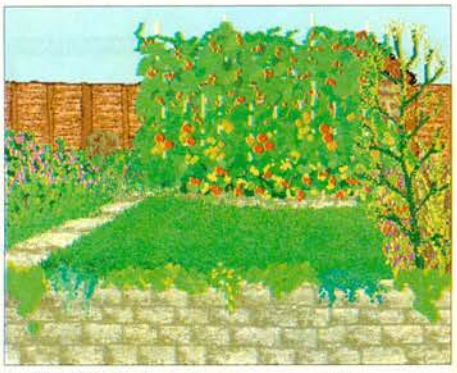
● *Next month we'll take a look at the remaining principles of CAP – computer-aided painting*



● *Giving texture to the wall provides the needed detail*



● *Creating flower beds is not so easy in the garden*



● *The finished gardenscape complete with overhanging plants*

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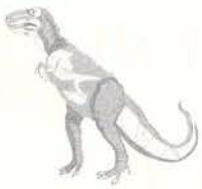

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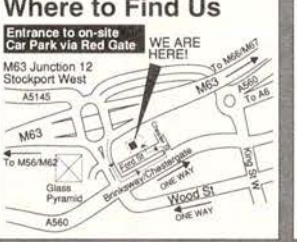

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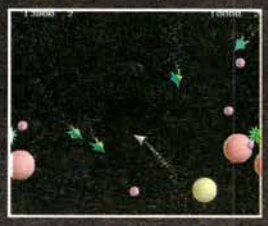

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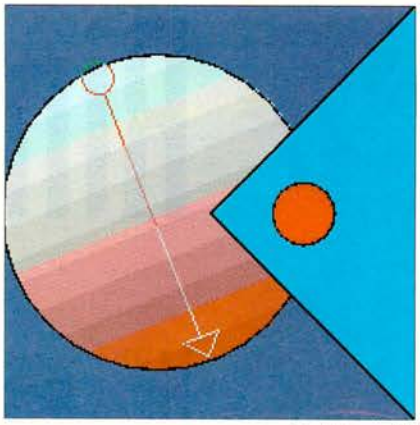
Changing its spots

Steve Bruntlett assesses the upgrades to Chameleon



● *A linear fill*

PRODUCT SPOTLIGHT

Product: Chameleon 2
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ONE of the major advances in computer-aided art and design of 1991 was the release of Chameleon, called *the easy-to-use Draw file editor*. It greatly extended the range of colour work which could be produced with Draw and DrawPlus, turning these programs into much more advanced graphic design tools without being over-complex to use.

Like Poster before it, Chameleon takes graphic design a stage further at an affordable price – especially for education, as the cost includes a site licence.

Chameleon was reviewed extensively in the February 1992 issue of *The Micro User* and here I'll be looking at the additional features of this new version of an indispensable program for anyone involved in CAD on the Archimedes.

Despite my comments in the review of the original version, Chameleon did allow you to edit line and fill colours without ungrouping objects. This is a major advance in trying to change colours in Draw or DrawPlus.

Objects with no fill colour can be filled, and objects without a line colour can have one added allowing you to complete drawings using Chameleon rather than having to go back into Draw.

There are four different styles of fountain fill for graduated shading: BandFill, ElliptFill, LinearFill and RadialFill. When any of these is selected the current colour window changes to show two colours – the start and end colour, selected from any of the three colour palettes – and an arrow with a spot indicating the start of the fill and an arrow indicating the end. Simply Select the starting point and drag to the finishing point.

You can see these arrows clearly in the illustration. The linear fill has a single arrow, while the band fill has a double-ended double arrow as the fill spreads outwards in opposite directions starting at any distance from the centre of the fill.

The radial fill has a double-ended arrow based on a central point to control the start point which can be away from the centre and the stop point which like other fills can be inside or outside the shape to be filled.

Finally the elliptical fill – a development of the circular one – has two arrows controlling the axes of the ellipse on which the fill is based. The arrow heads of the radial and elliptical fill can be dragged to define the limits. It's not really as complicated as it sounds and works very well in practice.

If drawings using fountain fills are saved with the data they can be reloaded and fully edited at any stage. They can also be saved as plain drawfiles, when the effect is maintained but is no longer editable.

You can choose colours from extended palettes including the RGB colour cube and a special 256 grey shade palette, and perform both local and global changes using selected colours on a variety of target areas.

There are also options to change the colour or hue of areas or turn the image grey. Colours can also be brightened, darkened, weakened or strengthened.

All colour changes can also be Undone and Redone to give you full control over your working procedure using a variable undo buffer. Images can be saved as highly compressed files compatible with Vector. Spot colour or CMYK colour separations can be saved with crop marks for anyone wanting to undertake screen-printing or colour publishing.

All in all, the print options are very comprehensive allowing you to print Draw or DrawPlus files of any size with or without trim marks.

● *The effects can be staggering*

Chameleon		Operation	
Target	⇨	Replace	A ⇨
Operation	⇨	Change hue	S ⇨
Tools	⇨	Make grey	D
Save	F3 ⇨	Brighten	F
		Darken	G
		Weaken	H
		Strengthen	J
		✓ Linear fill	Z ⇨
		Band fill	X ⇨
		Radial fill	C ⇨
		Elliptical	V ⇨

● *There is a range of fills at your disposal*

Summing up

Chameleon 2 is a joy to use and using the power of Risc OS 3 should enable you to develop further your creative skills using Draw, DrawPlus or Vector.

Ringing in the new

WITH only seven years to go to the millennium, the doomsday merchants will be winding themselves up just as they did in 993. You could panic, you could practise your surviving-the-holocaust-technique by playing numerous PD and commercial simulations and games, or you could make a New Year's resolution to worry about it in 2001 – but then there is always that monolith ...

To freshen up your shooting technique a superb new game called **Invaders** has been written by Tim Peugniez. Not a game of subtle innuendo – the nicely presented help file gives you the simple instructions of *if it moves shoot it* – it has excellent graphics and sound.

Swirling discs change colour from green to amber to red, shooting and if shot dropping spheres of bonus points. With simple but well executed gameplay, it will unfortunately only work on 2Mb or more machines. If you want a copy to add to your collection – definitely recommended – APDL, Skyfall and Arcaynia should be able to help.

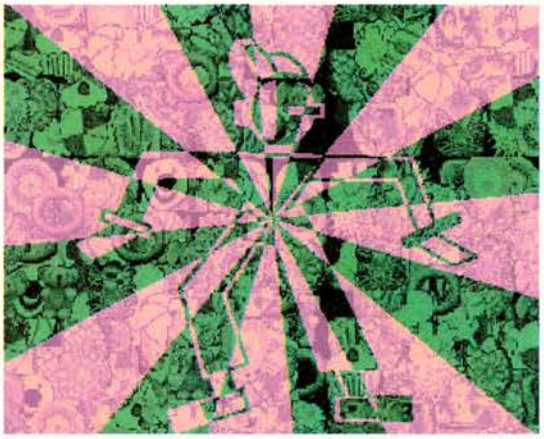
Tetris-cloned

Tertis from Merlin has bound many a person to their computer screen and an updated version is now available. If, like me, you get infuriated with the blocks that put themselves in random places at just the wrong time, then take a look at **Bloxed**.

Written by Steven Singer it isn't as impressive graphically as Tertis though there are some nice backgrounds of saved and scanned images. However, the gameplay has some excellent features. Have you ever wanted to drop a 16-ton weight on the blocks as they get nearer and nearer the top? Well now you can.

As you play, fitting the differently sized puzzle blocks to form lines, some appear containing symbols. When you complete a line with that symbol in it you'll be in for a surprise. This comes in various forms depending on the symbol: A bomb to blow up a portion of the blocks, a filler to add individual blocks where you want, a shooter to do the opposite, a 16-ton weight to squash everything and so on.

There are no levels – the blocks just come faster and I do miss the ability to slide one block under another. The response is a little slower than Tertis so be warned or you'll end up with a buffer full of key presses.



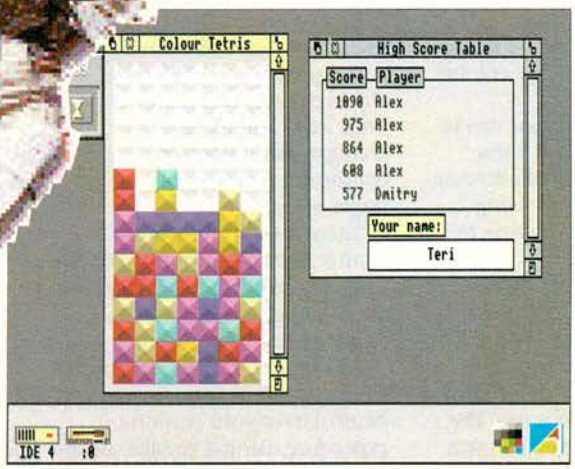
● *This new chaotic demo is a must for psychedlic ravers*

The music and sound effects are good, and optional, as are the special blocks. Yet the two-player game has the nastiest nobble that I've seen for many a year. If you complete more than one row with a single piece your blocks are transferred to your opponent. Evil.

From the home of the original Tetris, Russia, comes **Colour Tetris** written by Petrov Software. This game has been around in Russia since 1991 and works in the desktop.

The rules are simple. Vertical blocks of three descend and you can move them left, right, rotate or drop them –

● *A brand new implementation with nice added extras*



● *A superbly addictive Russian variant*

Teri Paul takes her monthly look at a selection fof the brightest and best of public domain software

sounds familiar. However, these blocks are all the same shape only the colours differ and it is the colours you swap around. Best in Mode 15 success is achieved when you create a vertical, horizontal or diagonal line of three or more.

A pause button allows you to stop to do some work and a high score table window contains the best five scores. There is a sound option but this hasn't been implemented – yet.

You can't define the keys, so your stuck with the arrows, but I found them easy to use and Colour Tetris has all the addictiveness of the original.

Must be raving

Party-time requires music and as you can't escape from rave tracks this year I'm not going to try. Hex have produced **Jelli** – as opposed to the earlier Jelly – which combines random computer-generated music with random computer-generated graphics. There are two tunes, Teknow and Daskapitak, both of which feature a chaotic funky dancer.

The results are best if you connect your machine to a hi-fi and display the graphics on a large screen to be seen from a few feet away. The messages are pro-environment and anti-meat and basically Jelli is a cut down version of Global Chaos, their CDTV title.

James Coates has produced a selection of tunes too, both for PD and commercial markets. Seasonally there is **PowerCarol** which uses SoundTracker to give you a compilation of carols using new techniques on some old favourites. Very nice it is too, where did I put my whistle ...

Another dimension

Like many people the publication of *The Blind Watchmaker* interested me in evolution and *Life*-style computer programs – I remember most of the computer magazines at the time featuring some aspect of this.

A. K. Dewdenys' The Armchair Universe inspired John Hendley to write a true cellular automata for the '90s – **3-Dimensional Life**. Space is split into a grid, and each space in the grid is a cell which can either be alive or dead. As the cosmic clock turns each cell assumes a state that is dependent on its previous position and those of its neighbours.

As this version gives a 3-D perspective there are 26 rather than 8 possible neighbours. Time can be frozen and multi-sync monitor owners will benefit from graphics written especially for them.

The help file is comprehensive and though you can just dive in, I'd recommend reading it first. In each corner there are the controls such as a picture of a hare to speed things up or one of a tortoise to slow things down. The space at your evolutionary disposal is a maximum of 62 cubes high by 62 across by 62 deep – depending on your machine's memory.

You can rotate the cube but don't forget the rules. The current rule governing the cells is shown on the Rule Bar. In total there are 27 symbols representing the cells. As you move the mouse you're told what is happening and the help file contains an ideas section of things you can try out.

● *You play with evolution and win?*

In addition you can shift direction, freeze the process or add *randomity*. The Edit mode allows you to define and run your own cube formations and introduces such concepts as wrapping. This process governs how the edges of the cube space act. With wrapping on cubes at the extreme edge of the space *touch* the cubes at the opposite edge. This means that space wraps around itself.

With wrapping off a dead zone is set up around the outside of the cube space, so any part of the cube at the edge of the space will read as a dead cell. For a nice effect you can toggle a fluorescent tube. 3D Life is very easy to get to grips with and is great fun to use – recommended.

PD LIBRARIES

8-bit houses

8-bit Software, 1 Oakwood Drive, Heaton, Bolton BL1 5EE.
BBC PD,18 Carlton Close, Blackrod, Bolton BL6 5DL.
Elk PD, 5 Edward Street, Clifton, Brighouse, Yorkshire HG6 1QR.
Frisky Clams, 37 Cassiobury Drive, Watford, Herts WD1 3AA.
GLM PD, 2 Pierrefondes Avenue, Farnborough, Hampshire GU14 8NF.
HeadFirst PD, 97 Chester Road, Southport PR9 7HH.
JJF PD, 49 Hollberry Close, Wingates Green, Redditch, Worcester B98 0QT.
Mad Rabbit PD, 174 Duke Street, Southport, Merseyside PR8 5EL.
MasterDisc, 2 Seaview, Hoylake L47 2DD.
ScreenTeach, 21 Highlands Road, Rochdale, Lancashire.
The Wizard - BBC, Ryburn, Thorpe Lane, Cawood, Selby, North Yorkshire YO8 0SQ.
Welsh Boys PD, 88 Queen Street, Barry, South Glamorgan CF6 8EE.
The Yorkshire Boys, 40 Spotswood Place, Gleadless, Sheffield S14 1LE.

32-bit houses

Abyss Software, 35 Grantley Crescent, Kingswinford, Valley Fields, West Mids DY6 9EH.
Alpine PD, PO Box 25, Craigavon, BT63 5UT.
Arcaynia, PO BOX 1927, Sutton Coldfield B74 3YZ.
ArchAngel, 9 Chancel Court, Chancel Lane, Pinhoe, Exeter EX4 8QE.
Arch PD, 109 Ferry Road, Hullbridge, Hockley, Essex SS5 6EL.
ARMistic, 136 Wellesley Road, Ilford, Essex IG1 4LJ.
Busy Bee Computers, PO Box 25, Ormskirk, Lancashire L39 3QR.
RE Clark PD Library, Westbourne House, 34 Bradley Street, Wooton-under-Edge GL12 7AR.
Cream PD, 38 Baunton, Cirencester, Gloscester GL7 7BB.
Datafile PD, 22 Duxford Drive, Aldergrove, County Antrim, Northern Ireland BT29 4BG.
DataStream, 34 Norbreck Close, Great Sankey, Warrington, Cheshire WA5 2SX.
Diamond PD, 86 Meadowbank, Moor Lane, Holway, Holywell, Clwyd CH8 7EF.
Different Ideas Music, 48 Merthyr Road, Dallington, Northants NN5 7BS.
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Digital Phenomena, 104 Manners Road, Southsea, Hants PO4 0BG.
DigiTech PD, 20 Downing Crescent, Bottesfird, Scunthorpe, South Humberside DN16 3LS.
Equinox PD, 27 Station Road, Earls Barton, Northampton NN6 0NT.
Five Star Marketing, 18 Woburn Close, Bushey, Herts WD2 3XA.
Genesis PD, 19 The Greenway, Hillfields, Bristol BS16 4HB.
HeadFirst PD, 97 Chester Road, Southport PR9 7HH.
I-APL, 11 Auburn Road, Redland, Bristol BS6 6LS.
Kinsway Computer Services, 72 Glencoe Road, Sheffield S2 2SR.
Low Cost PD, 6 Furzeland House, Sheephouse Way, New Malden, Surrey KT3 5PH.
Mad Rabbit PD, 174 Duke Street, Southport, Merseyside PR8 5EL.
Naked PD, Fayence, Fulford Road, Fulford, Stoke-on-Trent ST11 9QT.
Ozone-Friendly PD, 180 Cumnor Hill, Oxford OX2 9PJ.
Power to the Programmers, 1st Floor, 23 Cooper Street, Nelson, Lancashire BB9 7XW.
Moonlight Graphs – Shareware, PO Box 3569, Cape Town 8000, South Africa.
Risc PD, Potteries House, Rannoch School, By Pitlochry, Perthshire PH17 2QQ.
RML PD, 24 Penryn Close, Norwich NR4 7LY.
Skyfall, PO Box 2220, Birmingham B43 5R2.
Spidersoft PD, 218 Saville Park Road, Halifax, West Yorkshire HX1 2XS.

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- SID Utilities Disc 2 £5
- SID Utilities Disc 3 £5
- SID Utilities Disc 4 £5
- ST506 Hard Disc Controller Card £99
- A5000 Dust Cover 2pcs £9pr

Risc OS 3 Upgrades

- A 5000 Software Upgrade Kit £16
- Software Upgrade Kit for the rest £40
- Hardware Upgrade Kit 300/440 £25

A3000 Accessories

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- Monitor Stand £15
- Technical Manual £39
- Serial Upgrade £19
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- A3000 plus Monitor Dust Cover £9
- A3000 User Port/Midi Upgrade Card £44
- A3000 User/Analogue/IIC I/O Card £42
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The ultimate G8 range of Graphics Accelerator Cards from State Machine, for the Archimedes micro give more resolution, colours and speed.
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Watford's advanced interface allows IDE drives to work on any Archimedes machine, speeds in excess of SCSI devices can be obtained at a fraction of the cost of a SCSI drive.

Up to four drives are supported by the IDE filing system IDEFS, up to two drives can be attached to each expansion card, up to four cards can be installed in a machine. An optional 20Mb or 40Mb hard disc can be supplied on the podule expansion card itself, with its fast transfer rate and power saving modes the drive is ideal for storing commonly used software such as the !Fonts application.

A powerful security feature has been provided with the two unique commands *IDELock and *IDEUnlock, ideal for educational establishments where hacking or tempering may be prevalent that may lead to loss of data. Once locked, the configuration can not be changed until a secret password is used. The !IDEForm Write Protect option is particularly useful in conjunction with *IDELock as it will prevent any unauthorised deletion of data.

By an innovative use of on-board memory, the card will remember its configuration, even if moved to another slot or even a different machine, this also includes the unique security features.

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- Single width EuroCard
- Supports proposed ANSI ATA (IDE) specification
- Fast 16 bit MEMC interface interrupt driven to support background disc operations
- 5 Mbytes per second peak transfer rate
- Optional on-card 20Mb or 40Mb hard disc
- Up to two drives (master and slave) per card
- Multiple cards per machine (up to four)

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- Conforms fully to the Acorn IDE Specification
- All software supplied in ROM
- Filing system 'IDEFS'
- Desktop filer with drive ready detection and disc name under icon
- !IDEForm, WIMP based configuration and formatting software
- Drives can be individually write protected
- Up to four drives over multiple cards
- Power saving standby modes supported with configurable timeout
- Drives can be used without translation in native mode for minimum overhead
- !IDEFSDisk, creates PC emulator hard discs

Prices

Part No.	Capacity	Access Speed	Price
ADA 0520	44Mb	28mS	£195
ADA 0530	100Mb	16mS	£295
ADA 0570	200Mb	15mS	£449
ADA 0580	330Mb	15mS	£799

All the above 3.5" hard drives are supplied complete with Controller Card, cable & Software on ROM. (Internal fitting). For use with A300/A400/A500 series machines.

For A3000 users an additional external Case and PSU will be required.

AAA 0300 External Case & PSU for A3000 **£85**

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State of the art, 4 layer internal IDE Hard Cards for the A3000. Software supplied in, On-board ROM.

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Supplied ready assembled. No soldering required. Simply plug into the allotted space.

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Also available with 16-bit controller **£339**

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More Archimedes Products See Pages 3, 4, 5, 6, 7, 8

Archi to BBC Serial Link Mk 2

Using this simple data link, it is possible to solve all your BBC to Archimedes data transfer problems. The kit is supplied with a disk, and the necessary cable to connect the two computers.

New RISC OS Version also available (please specify)

- For A3000 **£15**
- For A5000 **£16**

For A3000 Serial Upgrade **(£19)** required

A3000 I/O Card (User, Analogue & IIC)

This NEW versatile I/O Card from Watford, fits inside the A3000 and includes an Analog to Digital Converter, a User Port, and an InterIC (IIC) connector.

The card allows many of the peripherals developed for the BBC to be used with the Archimedes A3000. The ADC and User Port have the same pin out and connectors as the BBC computers.

Extensive RISC OS software is supplied to provide BBC OSBYTE calls for support of the ADC and User Ports, including the BASIC keyword ADVAL. The software provides extended RISC OS support for separate interrupts from both the ADC and User Ports, permitting easy interrupt driven operation.

The card is provided with all the software in ROM and is automatically loaded when the machine is turned on.

Peripherals connected to the ports can obtain up to 500mA of power at +5V. A fuse is fitted to the card to protect the A3000 from damage arising from accidental short circuit of the power output.

Features

- An 8 bit User Port with a standard 20 way IDC connector, compatible with the User Port on the BBC computers and the Archimedes I/O Podule.
- A 10 bit Analog to Digital Converter with a standard 15 way D type connector, compatible with the ADC on the BBC range of computers and the Archimedes I/O podule.
- An InterIC (IIC) Port with a 5 pin DIN socket to connect the A3000 to external IIC devices.

£42

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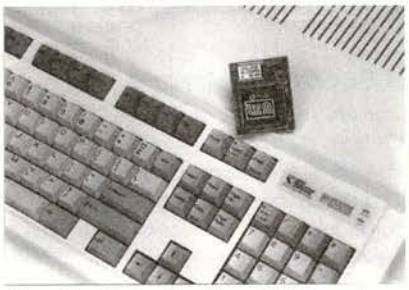

Here it is at last – the all new Mark 2 version of Watford's highly acclaimed ARM 3 processor board for the Archimedes and now also the A3000 series computers. Using the latest surface mount technology on a high quality four layer circuit board we have reduced the overall size to a mere 53mm x 45mm, and the cost to only £169. Mk II upgrade will increase the speed of your micro by a factor of 3 to 6.

Any competent A300 or A400/1 series micro owner can fit the upgrade himself, as we provide full fitting instructions and a special ARM chip extraction tool. However for A3000 micros and those not wishing to perform the upgrade themselves, we will collect, upgrade and return your micro by courier service, at an additional cost of £18.

(A300 and old A440 series owners please note – you will need to upgrade to MEMC1A for ARM3 to work.)

RRP £249

Christmas Offer £145

Acorn have satisfactorily evaluated Watford's ARM 3 upgrade and the A3000 upgrades are fitted by Acorn approved surface mount technology centre, therefore its fitment will not invalidate Acorn's warranty on the micro.

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MASTER 128K Micro incl. Acorn's View, Viewsheet, ADFS, BASIC Editor & TERMINAL plus FREE OFFER (see below) **£375**

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A 5.25" Double Sided, 40/80 track switchable 400K Disc Drive complete with cables and a Utilities disc incl. 2 games, plus

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Watford Electronics Aries PC Card

Access the world of MS-DOS from your RISC OS based computer

Watford Electronics brings you a full specification IBM compatible PC card for the Archimedes. You no longer require the Archimedes PC Emulator, all PC software is run locally on the expansion card with custom written software to interface the PC card into the RISC OS environment. The expansion card is a full hardware implementation, with the ability to be turned into an ISA Bus, fully fledged 386 PC just by the addition of a power supply, keyboard, storage device and a monitor!

Processor

386SXL 33MHz low power processor. Socket for optional 387SX 33MHz numeric co-processor.

On Board Peripherals

- Uses 82C107 single chip solution.
- 128 bytes of battery backed CMOS RAM.
- AT compatible Keyboard Controller.
- Uses standard Archimedes keyboard and mouse. Full standard ISA 16 bit expansion bus available.
- Optional expander allows one or two half size PC cards to be installed in the adjacent Archimedes expansion slots.

Memory

- Uses 82C311 memory controller 2Mb zero wait state DRAM as standard, upgradable to 4Mb DRAM just by adding 4 more chips.
- Bank interleaving and page mode memory operation for maximum performance.
- On-board BIOS ROM.

Display Controller

- Hardware support for VGA with 512Kb of video memory.
- On board Quadtel VGA BIOS ROM.
- Multitasking screen display on RISC OS.
- Desktop can be achieved in software.
- Separate VGA monitor can be connected for simultaneous RISC OS and PC display or your Archimedes VGA compatible monitor can be used with optional video switch.
- Much faster and improved video speed compared to PC Emulator.

Hard & Floppy Disc

- Full background disk access, the Archimedes is not adversely affected.
- Any existing Acorn PC Emulator hard disk partition can be used, with the ability to create new PC hard disk partitions on any RISC OS hard disk.
- Optional IDE hard disk and floppy drive option for direct connection of a dedicated hard disk and floppy to PC card.
- Access to the Archimedes floppy disc drive for reading and writing of PC disc formats from PC.

Bundled Software

- MS DOS 5.0, Lotus Works and PC Organiser

Sound

- Uses the Archimedes internal speaker by connecting to the Auxiliary sound connector.

Enhancements

Optional expansion card will be available either hardware parallel and serial ports or the ability to connect an external AT style keyboard and mouse.

The PC card can also be plugged into a stand alone backplane to form the heart of a fully expandable, industry compatible 386SX computer, with no reliance upon the Archimedes.

Specifications may be subject to change. E&OE.

Call, fax or write now for more details!

Scan256 – The only sensible scanner purchase

Scan256 – the innovative 256 grey-level hand scanner for the Archimedes range of micro computers. It offers up to 256 grey levels at a maximum of 400 dpi, and comes complete with the most advanced and sophisticated 256 grey scale scanner software currently available for the Archimedes.

- Multiple copies of the image in memory at once.
- Allows multiple consecutive operations without having to save the original image to disk.
- Instant re-draw of all 4 image buffers.
- No re-calculations needed unlike other packages that use on the fly screen-dithering.
- Highly advanced dithering and image size reduction.
- Available via industry standard Change FSI package for maximum image quality. An invaluable aid to reduce the size of the image whilst maintaining maximum image quality.
- Advanced in-built image processing options.
- Convolution digital filtering fully implemented with over 100 filters covering edge detection, image enhancement and image smoothing. Enables high quality images to be obtained from poor quality scans.
- A unique L.E.D. indicator on the scanner.
- Shows you when the scanner is being moved at close to the maximum scanning speed, not just when it is too late and a scan line has been missed by moving the scanner too fast.
- Fully adjustable scale and size of image preview when scanning
- Hand held scanner image preview window can even be behind other windows and preview is shown in real-time with maximum number of grey-scales available.
- Support for The Serial Port Graphics Enhancer.
- Forthcoming support for the State Machine G8 Graphics Card.
- Allows up to 256 simultaneous grey scales on screen at once.
- True brightness, contrast and gamma correction.
- All can be specified by a value to exactly match monitor/printer. No guessing with shapes of curves and correction is mathematically correct.
- RISC OS 3 features.
- Include rotation and shearing. Scans normally are scanned at a slant rather than being rotated, shearing enables the scan to be corrected better than rotation.
- Fast RISC OS printing.
- Multiple options such as scale to page, centre, sideways selected area, and any scale.
- Scanner scans at an amazing 3ms per line.
- A post card at 400dpi takes only 7.3 seconds to scan, creating over 3Mb of data.
- Selectable scanning modes.
- 256 grey-scale, 256 grey-scale half width, 16 grey-scale and monochrome scanning modes. Half width mode enables longer 256 grey-scale scans to be achieved.
- Save image foreign formats.
- Save as industry standard TIFF for exporting to other systems, AIM for further processing, or RISC OS Sprite format.
- Single width, high quality podule using surface mount technology

The only sensible scanning and image processing solution for the Acorn Archimedes. Just compare the features, there can only be one choice...

Scan256 Scanner, Interface Card, Software and Manual Only £185

Please specify Archimedes type.
Not compatible with A3010, A3020, A4000

Call now for details about our new Scan256 Flatbed Professional Scanner

BBC Education Software

A vous la France	French programs for beginners	£29
Au restaurant/Accident de route	French games for 12 years +	£26
Bolougne and oh les	French program for beginners	£26
Computer control	Program simulating computer control	£26
Computers at work	Primary education program	£17
Espana Viva	Spanish educational programs	£20
Folks Tales	Listening and reading for ages 7+	£22
Geordie Racer	Look and read for ages 7+	£22
Hall of Mirrors	Practice word & number skills	£22
Help your child learn basic mapwork 2		£18
Inside Science	Four common science subjects	£22
Letters and pictures	Educational programs for 6-8 years	£15
Make a wildlife garden	Explore wildlife/weather/garden growth	£22
Maths with a story 1	Primary level maths programs	£20
Maths with a story 2	4 further maths programs	£20
Note invaders	Learn sheet music for 7-Adults	£15
Numbers & Pictures	Early number learning (4-6 years)	£15
Picture craft	Geometrical design & Colouring	£17
Puncman 1 & 2	Learning Punctuation (7-13 years)	£15
Puncman 3 & 4	Learning Punctuation (8-14 years)	£15
Puncman 5, 6 & 7	Learning Punctuation (8-15 years)	£15
Ramayana Tales	Simple Desktop Publisher using pictures & characters from the Ramayana	£22
Skyhunter	Look and read educational adventure	£22
Technology and design	Problem solving programs	£22
Through the dragons eye	Adventure game and Map reading	£22
Fun School 3 (Under 5)	Varied range of Education subjects	£17
Fun School 3 (5-7)	Varied range of Education subjects	£17
Fun School 3 (Over 7)	Varied range of Education subjects	£17

Archi Educational Software

- Animated Alphabet (3-6 yrs) £21
- Arcventure (8-12 yrs) £29
- Bookbinder £43
- Bumper Disc £14
- Bumper Disc 2 £14
- Craftshop 1 £26
- Craftshop 2 £26
- Converta-Key £16
- Data Word £16
- Desktop Stories £35
- DigiSim £35
- Dream Time (5-7 yrs) £23
- Farm (5-7 yrs) £19
- Fleet Street Phantom (9-13 yrs) £25
- Fun School 3 Red (up to 6 years) £17
- Fun School 3 Green (6-8 years) £17
- Fun School 3 Blue (8 years +) £17
- Gate Array Teaching System £68
- Glimpse Clip Art Utility (7-16 yrs) £8
- Highlighter (6-16 yrs) £42
- Jigsaw £28
- Mapventure (9-13 yrs) £24
- Microbugs £24
- Money Matters £16
- Nature Park Adventure (7-9 yrs) £27
- Numerator £60
- Picture Book £16
- Recall (6-13 yrs) £39
- Sellardore Tales £24
- Snippet £26
- Space Mission Mada (9-13 yrs) –
- Sting of the Dump (9-13 yrs) £22
- Target Maths £16
- Viewpoints (9-12 yrs) £33
- Wizard's Revenge (7-10 yrs) £17
- Worst Witch (7-10 yrs) £25

Archimedes Software

GRAPHICS	
3D Construction Kit	£39
Arc Light	£46
ARCtist	£19
ARCticulate	£19
Art Works	£139
Atelier	£65
Artisan II	£45
Artisan Gallery	£16
Autosketch II	£65
CADet (CAD)	£140
Craftshop 1 & 2	£28
Euclid 2	£50
Graph Box	£59
Graphbox Professional	£107
HotLink Presenter	£40
Illusionist	£69
Kermit	£46
Mogul	£17
Poster	£79
Pro Artisan	£70
Prime Art	£69
Render Bender 2	£79
Revelation 2	£80
Snippet	£21
Titler	£119
Tween	£29

GAMES	
Air Supremacy	£17
Apocalypse	£14
Arcade Soccer	£14
Boogie Buggy	£14
Break 147 + Supa Pool	£19
Bughunter in Space	£19
Cataclysm	£19
Chess 3D	£16
Chocks Away Compendium	£32
Chocks Away Extra	£14
Conqueror	£15
Corruption	£18
Cyber Chess	£38
Elite	£33
Enter the Realm	£19
E-Type Compendium	£20
E-Type Designer	£13
Family Favourites	£13
Galactic Dan	£19
Grievous Bodily Arm	£19
Holed Out Designer	£13
Holed Out Golf Comp	£20
Hostages	£14
Inter Dictor 2	£26
Iron Lord	£15
Jigsaw	£27
Lemmings	£20
Oh no more Lemmings	£15
Lost Temple	POA
Lotus Turbo Challenge	£19
Mad Prof Mariarti	£17
Masterbreak	£16
Man at Arms	£14
MahJong Patience	£15
Manchester United II	£19
Mig 29	£24
Nebullus	£21
Nevryon	£14
Nevryon II	£20
Olympics	£14
Omar Sharif's Bridge	£23
Pandoras Box	£18
Pipe Mania	£17
Populous	£23
Power Band	£14
Puncman 1 & 2	£16
Puncman 3 & 4	£16
Pysanki	£14
Quazer	£10
Real McCoy	£22
Real McCoy 2	£23
Real McCoy 3	£22
Redshift	£14
Return to Doom	£16
Repton 3	£14
Saloon Cars Deluxe	£27
Spitfire Fury	£22
Splice	£25
Sporting Triangles	£24
Superior Golf	£14
Superpool + Break 147	£22
Swiv	£19
Talisman	£12
Timewatch	£24
Trivial Pursuit	£22
Twin World	£15
U.I.M.	£23
White Magic 2	£15
Wimp Game	£13
Worldscape	£16
XFire	£19
Zelanites	£23

Miscellaneous	
Ancestry	£59
Arccomm 2	£38
Arcterm 7	£64
Armadeus Sound	£60
Avante Garde Fonts	£23
BBC DFS Reader	£6
Broadcaster Loader	£65
Compression (CC)	£38
Equasor	£38
FlexiFile	£97
Genesis Plus	£68
Genesis 2	£99
Investigator 2	£22
Magpie 2	£42
Notate	£42
Numerator	£66
Pin Point	£65
Presenter 2	£29
Presenter Story	£145
Prophet	£132
Prophet Demo Disc	£10
Rainforest	£17
Revelation 2	£95
Rhapsody in Blue 2	£45
Score Draw	£46
Show Page	£127
Speech!	£15
The Victorian	£17
Time Tabler	£549
Toolkit (Clares)	£35
Touchtype	£40
Tracker	£39
Turbo Driver BJ10E	£42
Vox Box	£46
WorldScape	£17

LANGUAGES (Archimedes)

ISO-PASCAL; FORTRAN 77 **£77 each**
Assembler; LISP; Prolog X **£149 each**

Desktop C	£199	Logotron Logo	£45
Macro Assembler	£40	Risc Basic	£120
Robo Logo	£69	Risc FORTH	£110
BASIC Compiler	£77	Cambridge Pascal	£95

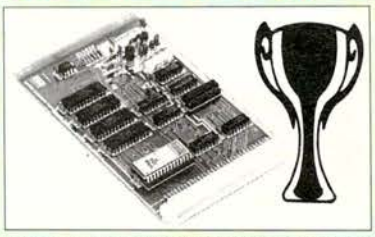
Archimedes External Disc Drive Interface

With this interface it is possible to connect almost any 5.25"/3.5" disc drive with its own power supply to the Archimedes. Upto 4 disc drives can be connected. Fully Buffered Board. NO SOLDERING is involved. Supplied complete with necessary lead.
Price £21

Back Plate Extension

- A300/400 £15;
- A3000 £14

Archi Real-Time Digitiser



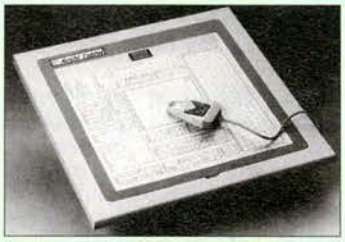
Now supplied with NEW RISC OS Version Software

Watfords' Archimedes Video Digitiser is the most sophisticated digitiser ever designed for a micro. It provides a fast and flexible means of capturing images from a video camera or recorder for display and manipulation on the Archimedes range of Micros. Off-air televison signals may also be digitised via a video recorder or TV tuner. Please write for further details.

Price £119

A Set of Colour Filters for colour image grabbing using a video camera **£16**

Archi Graphic Tablet



The Archi Graphic Tablet offers performance and accuracy comparable to other tablets priced at well over £400, and has the useful addition of a liftable cover, which can hold tracing material or menu templates securely. The package is supplied complete with sophisticated Archi software. (Now, fully LinCAD compatible. Recommended by Linear Graphic for use in Education).

(FREE this month, PC Mouse Drivers & Art package)

Special Price £199

(Price includes Tablet, Leads, Software & Puck)
Stylus Optional Extra **£20**

Archi Graphic Tablet Junior. Working area 9" x 6". Price includes Stylus **£125**

Concept Keyboards

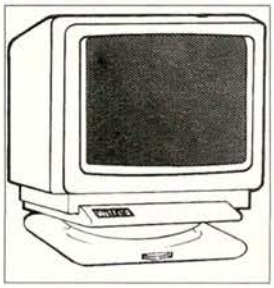
- A4 Standard Pack £95
- A4 Primary Pack £100
- A4 Designer Pack £110
- A3 Standard Pack £99
- A3 Primary Pack £105
- A3 Designer Pack £110

- Universal 2010 Keyboard A3 £115
- Universal 2010 Keyboard A4 £110

Cortian CKAI Interface

Eliminates the need to have a User port in A3000, A5000 and any other Archimedes without User Port. Fits to the Econet socket. **£29**

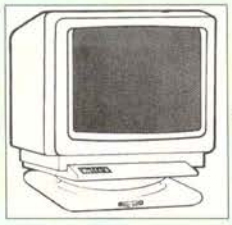
STAR BUY MONITOR



This attractively finished, etched screen medium res monitor is supplied complete with built-in speaker, volume control and video input. All controls are located on the front panel for ease of use.

Ideal for BBC, Archimedes and Amiga.

Only £149



FREE
Connecting lead with every monitor purchased from us. Please specify type required.

Microvitec Monitors

- **1431** – Standard Resolution Monitor #£169
- **1451** – Medium Resolution Monitor #£209
- **Cub3000** Medium Res for A3000 #£189
- Dust Cover for Microvitecs £5.50
- **Touchtec 501 Touch Screen** £239

Includes 3 years parts & labour warranty

Multiscan Colour

• Eizo 9060S	£389	• NEC 6FG	£1485
• Eizo F550i	£726	• Taxan 787	£210
• Eizo T560iT	£1319	• Taxan 787LR	£230
• Eizo T660i-T 20"	£1615	• Taxan 795	£394
• NEC 3FG	£345	• Taxan 875	£670
• NEC 4FG	£442	• Taxan 875+	£705
• NEC 5FG	£827	• VIDC Enhancer	£25

Aries AlphaScan Monitor

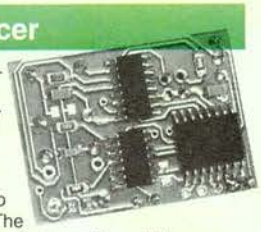
Its multiscan circuitry provides automatic adjustment for frequencies between 30 and 60KHz horizontal, and 50 and 90Hz vertical. Its 0.28mm dot pitch high resolution tube provides super sharp text graphics, while a high speed (70/72Hz) refresh rate provides a flicker-free display easing the eye strain. The Multivideo VIDC Adaptor supplied with the monitor allows high resolution operation in all screen modes. **£325**

- Aries Alphascan 17" Plus £545

Philips Monitors

- **BM7502** 12" Hi-res Green Monitor £74
- **CM8833** 14" Med. Res Colour Monitor £179
- Dust Cover for Philips Monitors £6
- Spare Monitor Leads (various) £7

VIDC Enhancer



This unique VIDC add-on board for the Archimedes, caters for all types of Multiscan and VGA monitor and mode requirements. There are 2 versions to suit all requirements. The multimode software supplied, provides all the new modes for the selected monitor type, including the now standard Computer Concepts modes. With VGA monitor, you are no longer restricted to a few modes. A Desk Top application supplied on disc, allows new modes to be designed and existing modes to be modified for particular monitors.

Super VGA VIDC Card: Its unique design allows the horizontal and vertical sync to be buffered and have the polarity changed under software control **£45**

MultiVideo VIDC Card: As above but for MultiScan monitors only. **£25**

Integrex Ink Jet Printers

- Colour Jet 132 Printer £425
- Paper Roll £6.50
- BBC Screen Dump Software £10
- Colour Cartridge £21 • Black Cartridge £12.40
- 100 A4 OHP transparencies £55
- 8K Serial Interface Optional £123
- Colour Jet 2000 £529
- Betajet Ink Jet Printer £185
- Betajet Cut Sheet Feeder £43
- Integrex Colourjet Series 2 £POA

Star Printers

LC15	£168	LC200 Colour	£140
LC20	£99	SJ48 Inkjet	£165
LC100 Colour	£136	XB24-200 Colour	*£288
LC24-15	£233	XB24-250 Colour	*£350
LC24-20	£148	XB24 Colour kit	£29
LC24-100 Colour	£162	ZA200 Colour	*£230
LC24-200	£162	ZA250	*£295
LC24-200 Colour	£205		

- Star/Archimedes Colour Printer Driver £15

* Includes 12 months On-site warranty

Cut Sheet Feeder

LC10/200/24-10	£65	LC15/LC24-15	£125
XB24-10	£80	XB24-15	£139
XB24-200	£99	XB24-250	£149

Serial Interfaces

8K Ser LC-200; LC24-200; FR10; FR15; XB24-10; XB24-15 £52

Buffers

32K Ram Card for LC/XB24-10; 15; LC200 £55

Star Printer Ribbons

LC10; LC10-II; LC15	Black £4;	Colour £6
LC-200; LC24-200	Black £5;	Colour £12
XB24-10; XB24-15	Black £5;	Colour £12

- Dust Covers for Star Printers £6

NEC Pinwriter Printers

• P20#	£169	• P70	£396
• P30	£235	• P90	£603
• P60	£322		

- P60/70 Colour Option Kit £59
- Ribbons Black for P20/30 £6 for P60/70/90 £7
- Ribbons for P60/70/90 Black £9 Colour £13.50

Includes 12 months on-site warranty

Cut Sheet Feeders

P20 £59; P30 £85; P60 £89; P70/90 £80

Panasonic Printers

KX-P1123	£126	KX-P2123M	£165
KX-P1124i	£169	KX-P2123C	£195
KX-P1170	£98	KX-P2180M	£146
KX-P1624	£250	KX-P2180C	£152
KX-P1654	*£330	Colour Kit for KX P2123M/2180M	£38
KX-P1695	£267		
KX-P2624	*£268		

*** Price includes 12 months On-site warranty**

Cut Sheet Feeders

P36 – 1124/24i £79 **P37** – 1123/70/80 £69
P38 – P1624/95; P2624 £129

Buffers

P12 4K Buffer Board for KX-P1081 £55
P14 32K Buffer P1123/24/70/80 P1540/92/95; P1624/54/95 £16

Serial Interfaces

P13 for all above printers £49

Original Panasonic Ribbons

Guaranteed to last 3 million characters

P110 for KX-P1081, 1592 & 1595 £6
P115 for KX-P1180 £7 **P145** for KX-P1124 £7
P140 for KX-P1540 £8 **P155** for KX-P1624 £8
Colour Ribbons for KX-P1081, 1592 & 1595 Brown, Blue or Red £9 each
P150C Colour for P2123/2180 £15

Citizen Printers

• 120D Plus	£95	• Swift 9	£145
• 224	£174	• Swift 24X	£299
• 240 Colour	£212	• 24X Colour Opt	£32
• PN-48	£199	• PN48 Ribbon	£4

- AH29804 Manual Cut Sheet Feeder for Swift 9/24/124. Holds 50 Sheets £29

+ FREE 2 years Parts and Labour warranty on all Citizen Printers

- Swift 9 Colour Option £19
- Swift 24 Colour Option £29
- Swift 24 Ribbons Black £4 Colour £13
- Swift 24X Ribbons Black £8 Colour £16
- Citizen/Archimedes Colour Printer Driver £15

Laser Printers

All Laser Printers include 12 months On-site maintenance

Brother HL4-VE	4ppm	£549
Brother HL4-V	4ppm	£639
Brother HL4-PS Postscript	4ppm	£970
Brother HL8-V	8ppm	£894
Brother HL-10V	10ppm	£1059
Brother HL10PS	10ppm	£1329
Brother HL10DV	10ppm	£1149
Brother HL10DPS	10ppm	£1449
Canon LBP4 LITE	4ppm	£479
Canon LBP4+ 1.5M RAM	4ppm	£632
Canon LBP-8III Plus	8ppm	£945
Canon LBP-8 plus IIIR	8ppm	£1435
Epson EPL4300	4ppm	£566
Epson EPL4000	6ppm	£475
Epson EPL7500	6ppm	£1139
Epson EPL8100	10ppm	£920
Fujitsu VM800 (Best Buy)	8ppm	£685
HP Laserjet IIP+	4ppm	£530
HP Laserjet IIID	8ppm	£1487
HP Laserjet IIIP	4ppm	£595
HP Laserjet IIIsi	16ppm	£2419
HP Laserjet IV (600 dpi)	8ppm	£989
HP Laserjet 4M PS	8ppm	£1369
NEC Silentwriter S62P P/script	6ppm	£1019
NEC Silentwriter 266	8ppm	£669
NEC Silentwriter 290P P/script	8ppm	£1369
NEC Silentwriter S102	8ppm	£989
OKI OL400	4ppm	£440
Panasonic KX-P4410	5ppm*	£515
Panasonic KX-P4420	8ppm*	£615
Panasonic KX-P4430 Satin Print*	5ppm*	£586
Panasonic KX-P4451	11ppm*	£1028
Panasonic KX-4455 Postscript	11ppm*	£1349
Star LP-8 III 2	8ppm	£1249
Star LP-8 III	8ppm	£890
Star LP-8 Star(post)script	8ppm	£1130
Star LP-4	4ppm	£565
Star LP-4 Mk 3	4ppm	£589
Star LP-4PS Postscript	4ppm	£769

* Now with 2 years On-site warranty

Laser Toners

Canon 2, 3 & 4	£46	Star LP4/LP8	£56
Epson GQ	£13	KX-P4420/30	£24
EPL 4100	£69	Laserjet HP IIP & IIIP	£42
EPL7100/7500/8100	£125	Laserjet II/D, III/D	£48
HP 4	£75	Qume Crystal (3)	£58

Laser RAM Upgrades

IIP; III/P 1Mb	£49	Canon LBP8 2M	£125
IIP; III/P 2Mb	£80	EPL7100 256K	£39
IIP; III/P 4Mb	£132	GQ5000 512K	£42
II & IID 1Mb	£60	KX4420/50 1M	£75
II & IID 2Mb	£96	KX4420/50 2M	£115
II & IID 4Mb	£142	KX4420/50 4M	£195
HP4 1Mb	£65	Star LP8 1M	£139
Canon LBP4 1M	£105	Star LP8 2M	£275

Laser Drum & Developer

• Epson Drum	GQ5000	£93	EPL7100	£129
• Panasonic 4420 Drum		£60	Developer	£59
• Panasonic 4450 Drum		£93	Developer	£80
• Qume Drum		£76	Developer	£56

Jetpage Postscript Cartridge

• HP IIP/III	£225	IID & IIID	£227

Various Add-Ons

- HP Adobe Postscript £399
- HP Premier Font Collection £28
- Laserjet various Font cartridges from £45
- Canon LBP-4 Lower Cassette Tray £75
- Pacific Page Postscript £259

Laser Direct

- Special High Res Card 600 DPI for Canon LPB 4 & LPB 8 Laser Printers £315
- LPB 4 Printer plus High Res Card £945
- LPB 8III Printer plus High Res Card £1275
- LPB 4 Optional Paper Tray £79

Hewlett-Packard Printers

DeskJet 500	#£255	DJ500 colour	#£325
DJ550 colour	#£415	Paint Jet	+£495
Paint Jet XL	+£1045	PaintJet XL300	+£1775
QuietJet	+£293	QuietJet plus	+£379

+ Includes 12 months on-site warranty
# Includes 3 years extended parts & labour warranty
• For additional £50, (£75 for DJ500 & 550 colour), we will convert above 3 years warranty, to 3 years on-site maintenance warranty

- DeskJet 500 Cart. Black **£14;** Colour **£23**
- Paintjet Cartridges Black **£19;** Colour **£23**

Desk Jet 500 Accessories

- 256K RAM Cartridge £69
- HP Epson FX Emulation Cartridge £59
- High Capacity Black Ink Cartridge £21
- 50 x A4 Transparencies £32
- DJ500 Colour Archimedes Printer Driver £15
- Dust Cover £6
- DJ500 does not require Archimedes Driver

Plug In Font Cartridges for DJ 500

- 22706B – Prestige, Elite, Line Draw fonts £55
- 22706C Letter Gothic & HP Line Draw fonts £56
- 22707P – Proprint Emulation Cartridge £57
- Desk Jet Unlimited (Book No VAT) £19.75

Canon Bubblejet Printers

	Printer	CSF	D'ble Bin	Ink Cart
BJ10EX	£160	£43	–	£16
BJ20	£248	–	–	£16
BJ200	£275	–	–	£16
BJ300*	£335	£88	£65	£12
BJ330*	£373	£110	£79	£12
BJC800C	£1355	–	–	£16

* Includes 12 months On-site warranty

- Spare Battery pack for BJ10E £33
- BJ10EX – Archi Turbo Driver £42

Special Offer:
Canon BJ10EX Printer + CC's Turbo Driver £210

Epson Printers

DFX5000	£1069	LQ1070	£308
DFX8000	£1920	LQ1170	£429
FX850	£255	LQ2550+	£669
FX870	£POA	LX100	£117
FX1050	£322	LX400	£90
FX1170	£POA	LX850+	£134
LQ100	£144	LX1050	£199
LQ570	£197	SQ870	£409
LQ870	£352	SQ1170	£560
LQ1060 Colour	£588	SQ2550	£669

- Tractor Feed for LQ100 £29
- Original Ribbon for LQ100 £6

Cut Sheet Feeders for
LQ570, LQ870 £47
LX400/850/LQ200/400/450/500/550 LQ1010/1070/1170 £72
LX1050 **£115** FX850/LQ860 £128
FX1050/LQ1060/SQ850 £155
LQ2550 **£299** SQ2550 £210

Tractor Feed for
LQ800 **£44;** LQ850/FX850 **£69;** LQ1050/FX1050 **£85;** LQ2500 **£90;** LQ2550 **£90.**

Accessories

- EX800/1000 Colour Option £45
- EX800/1000 Colour Ribbon £14
- LQ2500 Colour Option £65
- Multifont Card for LQ550/850/1050 £95

Epson Printer Interfaces
RS232 **£28** RS232 + 2K Buffer £52

Printer Leads

BBC Centronics 4' long	£5
BBC Centronics 6' extra long	£7
Compact's Special Centronics Lead	£7
Nimbus Centronics Lead	£6
IBM/Archimedes Parallel Lead 6'	£5
IBM/Archimedes Parallel Lead 5 metres	£10
IBM/Archimedes Parallel Lead 10 metres	£15
Double Ended 36 way Centronics Lead 4'	£7
Double Ended 36 way Centronics Lead 6'	£9
RS232 Leads (Various)	P.O.A.

Roland Plotters

- DXY1100 **£488** • DXY1200 **£620**
- DXY1300 **£825** • DXY2500 **£2345**
- Sketchmate A3 **£499** • Sketchmate A4 **£308**
- Roland plotter Pens, Fibre tip £7.50

Fujitsu Printers

Special Introductory Offer

- B-100 InkJet – HP Deskjet compatible 300dpi, whisper-quiet & 6 resident fonts #£175
- B-200 InkJet – HP Desk Jet compatible 300dpi. Built in Cut Sheet Feeder. Optional 2nd Bin/Tractor available #£249
- DL-1100 Dot Matrix – 24 pin, 110 column Colour optional £199
- DL-1100C Dot Matrix – 24 pin, 110 column With colour option £235
- VM-800 Laser – 8 page per minute, Laserjet 3 compatible, 350 sheet paper tray, Resolution enhancement #£685

FREE 1 Year On-site maintenance, within mainland UK

- B-100 Cut Sheet Feeder £59
- B-200 2nd Bin Sheet Feeder £89
- B-200 Tractor Unit £59
- B-100/200 Ink Cartridges £14
- DL-1100 Colour Upgrade £39
- DL-1100 Black Ribbon £5
- DL-1100 Colour Ribbon £11
- VM 800 Toner Cartridge (8000 pgs) £99

Full range of Fujitsu Printers available at very competitive prices. Please telephone for details

Listing Paper (Perforated)

- 1,000 Sheets 9.5" x 11" Fanfold Paper £7
- 2,000 Sheets 9.5" x 11" Fanfold Paper £11
- 1,000 Sheets 9.5" x 11" NCR 2 Part Fanfold £21
- 1,000 Sheets 15" x 11" Fanfold Paper £9
- 2,000 Sheets 15" x 11" Fanfold Paper £16
- 1,000 Sheets true A4 Fanfold Paper 70gms £11
- 2,000 Sheets true A4 Fanfold Paper 70gms £21
- Teleprinter Roll (Econo paper) £4
- Telex Roll 50 metre £3

(All our Fanfold paper is Micro perforated leaving a smooth clean edge when the tractor feed strips are detached).

Carriage 1K Sheets £2.50, 2K Sheets £3.00

Printer Labels

(On continuous fanfold backing sheet)

1,000 off, 90 x 36mm (Single Row)	£6.00
1,000 off, 90 x 36mm (Twin Row)	£6.25
1,000 off, 90 x 49mm (Twin Row)	£7.50
1,000 off, 102 x 36mm (Twin Row)	£6.75

Laser Printer Labels on A4 Sheets

3750 off, 70 x 29mm (3 Rows x 10)	£15.50
2400 off, 70 x 37mm (3 Rows x 8)	£15.25
2625 off, 70 x 42mm (3 Rows x 7)	£15.00

Printer Ribbons & Various Dust Covers

Type	Ribbons	Dust Covers
BBC B/BBC Master	–	£4.00
Archimedes Micro pair	–	£9.00
Citizen 120D	£3.25	£5.00
DMP2000/4000	£3.75	£4.95
EX800/1000	£3.50	£5.00
RX/FX80/85/800/MX80	£2.95	–
FX/MX/RX100/1000	£3.95	–
Kaga/Taxan KP810/815	£3.25	£5.00
LQ400/500/550/800/850	£3.25	£6.00
LQ1050/LQ2500	£12.00	–
LX80/86	£2.75	£4.50
LX400/800/850	£3.50	£5.00
M1009/GLP	£2.95	£3.75
NEC P2200	£4.50	£5.00
Panasonic KX1080/81	£6.00	£5.00
Panasonic KX-P1124	£7.00	£5.00
Star LC24-10	£2.95	£6.00

Professional Printer Stand

The professional printer stand takes hardly more space than your printer. Due to the positioning of the paper feed and re-fold compartments ie. one above the other, the desk space required for your printer functions is effectively halved. Its ergonomic design ensures smooth paper flow and automatic refolding.

80 Column version £24 (carr. £3)
132 Column version £29(carr. £4)

Universal Printer Sharers/Changer

Connect up to 5 Micros to 1 printer or 5 printers to 1 Micro with our combined, Sharer/Changer switch boxes.

Standard Low Cost Type

Connects	Serial	Parallel
• 2 to 1	£12	£13
• 3 to 1	£16	£18
• 4 to 1	£23	£24

Professional Type

Connects	Serial	Parallel
• 2 to 1	£17	£18
• 3 to 1	£22	£25
• 5 to 1	£34	£38

Cables extra at £6 each

Cross Over Manual Switch

2 In/2 Out Parallel	£29
2 In/2 Out Serial	£28
3 In/2 Out Serial	£36

Auto Printer Sharer

Connects	Serial	Parallel
2 to 1	£40	£45
4 to 1	£62	£49
8 to 1	–	£89

256k Multi Spooler

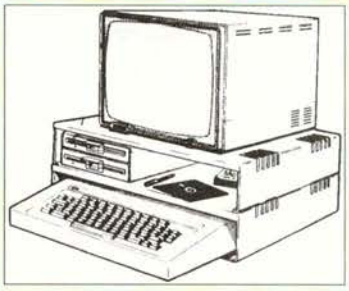
These Auto Parallel Printer Sharers have built-in 256K of Printer Buffers. They can be used as Auto Sharers, Printer Buffers or both.

- 2 In/2 out **£135** • 4 In/2 out **£169**
- 8 In/1 out **£199**

Compact Converter Units

Serial to Parallel **£36** Parallel to Serial **£37**

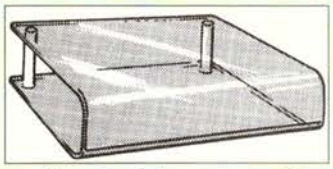
Plinths for the BBC B, BBC Master & A3000



Protect your computer from the heat of your VDU. Our micro plinths have slots for maximum ventilation. The single plinth is suitable for a BBC and VDU, whilst the double height version provides enough room for our stacked disc drive and other peripherals like, Eprom programmer, music unit or simply discs & stationery. The computer slides neatly in the lower section allowing easy access to remove the lid. Colour: Matching BBC Beige.

- Single BBC Plinth 420 x 310 x 105mm £13
- Double BBC Plinth 420 x 310 x 210mm £24
- Single Master Plinth 490 x 310 x 105mm £14
- Double Master Plinth 490 x 310 x 210mm £26
- A3000 Single Plinth (very sturdy & precision made), has a slot on the left for the switch & cut out on the right for 3.5" Disc Drive £15

Perspex Printer Stand



Give your Computer System a touch of Class with our elegant, smoke finished Perspex Printer stand.

80 Column version **£16** (carr £3)
136 Column version **£20** (carr £4)

Continued→ → → → → → → → →

QUEST MOUSE Mk III

- Quest Mouse III & Quest Paint £49
- Quest Mouse III, Quest Paint, AMX Stop Press & Pagefont £69
- Quest Mouse III only £25
- Quest Paint Software only £28
- Quest Font Disc (22 Text Fonts) £15
- Quest Mouse Mat (Red or Blue or Green please specify) £3
- Quest Colour Dump Disc – This new software allows you to print direct from Quest Paint to your Integrex Colour Printer £18
  (P.S. Quest Paint is not compatible with BBC Compact)

Quest Paint is the winner of the BBC Acorn User 1990 Award for the Best Art/Graphics software

ConQuest

Quest combined with ConQuest and Acornsoft GXR ROM make up THE MOST POWERFUL drawing packages available for the BBC range. Quest Paint is able to take advantage of almost any additions to your machine, such as Shadow or Sideways RAM. ConQuest takes this principal even further, by utilising the otherwise normally incompatible Sideways RAM facility by holding pictures in them.

ConQuest ROM Package £28
(Price includes software in ROM and a comprehensive Manual).
(Not Compatible with BBC Compact)
(P.S. Conquest is a Quest Paint extension ROM).

Mouse Cleaning Kit

To obtain trouble free operation and prolong the life of your mouse, the high tech rodent requires regular cleaning. Our deluxe mouse cleaning kit is ideal for the purpose £3

BEEB VIDEO DIGITISER

"Test Bureau Approved for Use in Education"

Using any source of composite video (colour or monochrome) and the Watford Beeb Video Digitiser, you can convert an image from your camera into a graphics screen on the BBC Micro.

Winter Sale Price £75

(BBC B, B+ and Master 128 compatible, except Master with Econet)

(Price includes: Digitiser Unit, Software in ROM & a Comprehensive Manual)

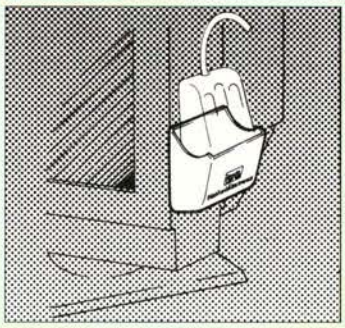
Archi Mouse Port Splitter

Our handy little splitter unit eliminates the risk of damaging your micro due to constant plugging and unplugging of the mouse by allowing you to connect both, a joystick and a mouse simultaneously to your Archimedes. £15

Mk III AMX MOUSE

- **AMX Mouse plus Super Art £49**
  (Please specify for BBC, Master or Compact)
- AMX MOUSE ONLY £25
- AMX SUPERART Package £26
- AMX STOP PRESS – A Desktop publishing software. Works with Keyboard, Joystick or a mouse £25
- PAGE-FONTS – Over 20 Fonts for use with AMX Pagemaker £13
- AMX DESIGN (ROM) £29
- AMX EXTRA EXTRA £16
- MOUSE MAT £3

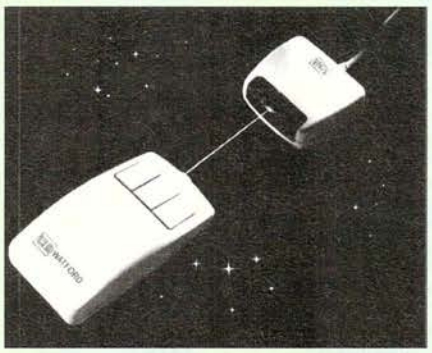
WE Mouse House



Treat your mouse to a cosy Mouse House. This handy little gadget solves the problem of where to store your mouse when it is having a rest. Made of sturdy plastic, the WE Mouse House attaches to the side of your computer, monitor, disc drive etc.

Only £3

Archi Cordless Mouse



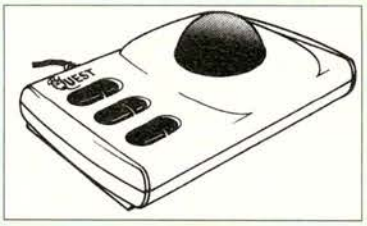
Features
- Infra Red Signal Transmission
- High Resolution 200 DPI
- High Tracking Speed of 600mm/s up
- Anti-static Silicon Rubber Coated Ball
- Low Friction Teflon Footpads
- Power - by two AAA size batteries (not included)
- Automatic Standby Mode after 5 seconds inactive
- Auto Power Shut-Down after 20 seconds inactive

Price £39

CREDIT CARD 24 HOUR Ansaphone Hot Lines (0923) 250234 or 233383

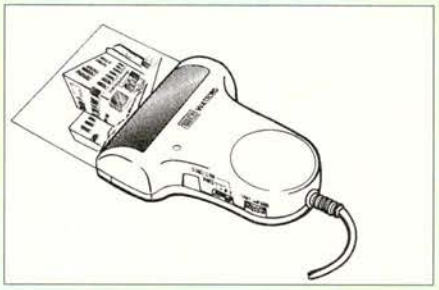
Quest – Tracer ball

An attractively finished, extremely reliable, mouse replacement, input device. Requires very little desk space. Connects directly to your BBC B, BBC Master or Archimedes Micro.



QT-10 BBC/Master Version £25
QT-20 Archimedes Version £26

Beeb Hand Scanner



Watford Beeb HandScan is a compact unit which will allow photographs, diagrams, or any other documents to be digitised quickly and easily, to then be used in a desk top publishing package, art program, or even in your own Basic programs!

The HandScan plugs directly into the 1MHz bus on the BBC while a comprehensive set of utilities provided by the sophisticated ROM firmware. The scanner has a resolution of either 100 DPI or 200 DPI when accuracy is essential. Pictures as wide as 4" may be scanned in mode 0 and various types of dithering may be selected to simulate the grey levels of a scanned picture.

All necessary software has been included in the firmware to allow the scanner to read images directly into our Wapping Editor with little more than the click of the mouse. The digitised picture may then be incorporated into your magazine, newsletter, report or any other document.

Beeb HandScan & Firmware **£99**

Archi Mk II Hand Scanner

Watford's Mk II hand scanner has a maximum resolution of 400 dpi. The scanning width is 4". The sophisticated software is supplied in a 64K ROM, located on a standard single width expansion podule. As you scan a page, the image appears in the scanning window on the screen, scrolling up in real time. Other facilities include Cropping and scaling to any size including stretching and squashing in X and Y directions separately. Colour tinting. X and Y flip. Edge detection which turns solid objects into outlines.
Images can be printed on any printer supported by RISC OS.
On-screen help is provided via the RiscOS interactive help facility. (Please write in for full technical details).

AHS-4 Archi 300/400 Version £109
AHS-3 Archi A3000 Version £119

Winner of the BBC Acorn User 1990 Award for the Best DTP/Word Processor

The Wapping Editor

The Wapping Editor from Watford Electronics represents a breakthrough in Desktop Publishing for the Beeb. The package includes a 64K ROM containing ALL the software needed to get into print fast; a very sophisticated graphics module, professional quality typesetting software, a word processor, a comprehensive font editor for designing your own typefaces, and a variety of printer dumps. This mouse-driven system is designed for the BBC B, the B+ and Master computers and will take full advantage of any Sideways and Shadow RAM that may be fitted. It will run under DFS, ADFS and Network filing systems and requires as a minimum just a single 40 track drive.

Included with the system is a utility disc containing several high quality fonts, various utilities and a ROM image of a Support ROM. A comprehensive 100 page manual completes the package. The Support ROM contains routines to allow an area to be rotated to any angle or distorted to any four-sided shape. Also included are facilities to draw ellipses at any angle and sectors, segments and arcs (in Master or BBC B with Acorn GXR). Another of the features of the Support ROM is a 'Turbo DFS' which gives DFS access times comparable with those of ADFS.

Page Layout Section

The Wapping Editor may be used to create pages of any size from an A6 to a full A3 page. If none of the eight default page types suit your purpose, the stand-alone page creation program may be used to create pages to your own requirements. By using proportionally spaced fonts and genuine microspacing it is possible to print over 150 characters across an A4 page. A unique feature of the Wapping Editor is the 'A5 x 2' page size allowing two A5 pages to be printed side by side onto a single A4 sheet.

The graphics module incorporates the facilities like: pencil, brush, airbrush, polygon, circle, eclipse, fill, cut & paste, etc.

Text may be typeset, either justified or unjustified, in any font anywhere on the page. Simply select which font and text document you wish to use, and pull out a rectangle on the page where you want the text to be – it's as simple as that! Multiple columns may be printed just as easily and a special 'expand' feature may be used to expand the microspacing so that the document exactly fits the space defined.

Word-Processor

The integral word processor is the ideal tool for producing your text documents, although text can of course be read in from any of the other popular word processors such as View, Wordwise etc.

The Font Editor

The font editor module will allow you to design your own typefaces or to modify the ones provided on the utility disc. This sophisticated editor has numerous functions designed to take the tedium and frustration out of producing good looking, well balanced fonts. Each character may be individully proportionally spaced and characters of any size up to 16 x 16 pixels may be defined.
Pictures may also be 'grabbed' from a video source by using the Watford BEEB Video Digitiser.

Wapping Editor Software Pack	**£49**
Wapping Editor plus Mouse	**£69**

(Wapping Editor only works with Master Compact if a Mertec Expansion box is fitted)

Wapping Art Disc

Over 250K of clip art to cut and paste into your Wapping Editor pages. Pictures include maps, transport, people, media, sport, games etc.
Two 'ratio' screens for use with hi-res and rotated A5 pages to ensure images are not distorted when printed out.

Music writing symbols in the form of pattern and brush for quick production of manuscripts are included together with staves.

There are two prepared hi-res pages laid out for printing labels, both single and double width. Ready made label designs are included but these can be easily replaced with your own designs.

A Mode 0 screen dump routine is also included. To pack such a large amount of data onto the discs the screens have been compressed and routines to compress and expand Mode 0 screens are included on both discs. Using the packing routine you can archive large numbers of screens onto a single disc.

£15

Wapping Font Disc 1

Sixteen additional fonts, including smaller version of Oberon and Daisy and two new sizes of the standard font for the Wapping editor.
Also included are two Mode 0 screens containing giant 'headline' fonts to cut and paste to create extra smooth headlines.
Supplied complete with instructions.

£12

Wapping Font Disc 2

This new addition to our Wapping range of DTP software provides you with additional 23 fonts for the Wapping Editor DTP pack. (80 track discs only).

£13

Archi A4 Scanner

This most advanced Archi A4 image scanner is supplied complete with ROM based podule software. Features provided include facilities for zooming in on an image and inverting the image in X and Y directions, saving and printing of the sprite created. Interactive help is supplied using the !HELP application on the Acorn applications discs.
The 216mm scanning width can cope with both desktop scanning of single sheets, photographs, diagrams, etc., with its fast ten page automatic document feeder, but it can also detach from the feeder to become a convenient hand-held full page scanner for larger documents or pictures.
Scanned image control can be freely adjusted in increments of 10 dots per inch from 100 up to 400 dpi resolution with 64 levels of grey scaling. A built in shading controller and manual brightness control achieve optimum image clarity.
Unlike some scanners, which use a red light source, the Watford scanner uses a yellow/green source which vastly improves the light/dark contrast, thus eliminating the effect where any red-based colours are faded down to white and so do not show up in the scanned image.
All these features and facilities combine to make the Archi Page Scanner the fast and convenient way in which to add that extra impact, interest and clarity to documents, reports, instruction sheets, manuals, news letters, etc., from your Archimedes DTP package.

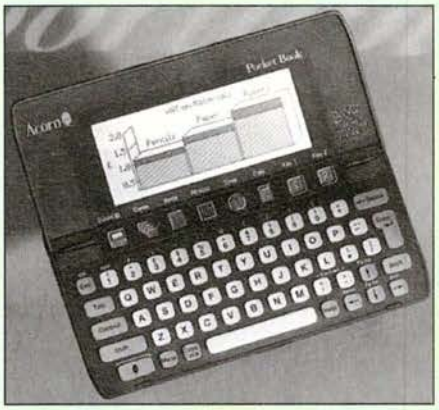
New Low Prices:

Archi A4 Scanner	£269
Sheet Feeder for above	£75
Scanner + Sheet Feeder	£359

Z88 Portable Micro

• Z88 Portable Micro	£169
• 32K RAM Pack or 32K EPROM Pack	£16
• 128K RAM Pack or 128K EPROM Pack	£32
• 512K RAM Pack	£86
• 256K Eprom Pack	£55
• Z88 Eprom Eraser Unit	£38
• Z88 Carrying Case	£8
• AA Nicad Rechargeable Battery	£1.50
• Battery Charger Compact & Fast	£6
• Z88 Serial Printer Cable	£8
• Z88 Parallel Printer Cable	£18
• Z88 to Archi Link	£15
• Z88 to BBC Link £8 • Z BASE	£56
• Z88 to PC Link II £27 • Z88 to Macintosh	£32
• Z88 Mains Adaptor £9 • Z88 Modem	£114

Psion Series III



Psion, pioneer of the handheld computer, have once again redefined the state-of-the-art with the Series III. Although only pocket sized, this powerful programmable computer has many features found in desk top machines, plus powerful built-in software. They include a full specification wordprocessor and an outliner that is compatible with Microsoft Word, an extensive database, intelligent time and personal management and a powerful multifunction calculator. And with an interchangeable memory of up to 4Mb, you'll never be short of data storage space.

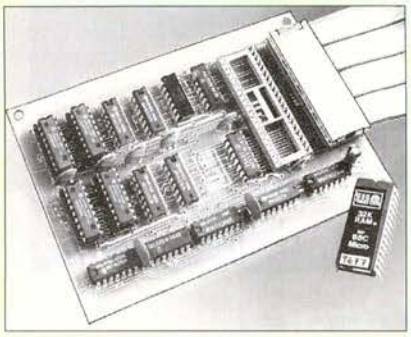
Psion Series III Computer

• Series 3 128K	£139
• Series 3 256K	£179

CREDIT CARD 24 HOUR Ansaphone Hot Lines (0923) 250234 or 233383

Continued→ → → → → → → → →

32K Shadow RAM/Printer Buffer Card Expansion Board



A MUST FOR WORD PROCESSING

Simply plug the ribbon cable plug into the 6502 socket and gain a massive 32K of extra RAM.

- "VIEW" Wordprocessor users can now type in letters in 80 columns and have up to 28K bytes free – 5 times as much as normal.
- In WORDWISE (or WORDWISE-PLUS), preview in 80 columns with the full 24k of text in memory. This product is recommended as an ideal complement by Computer Concepts.
- Use the full 32k or the bottom 12K of the expansion RAM as a printer Buffer. (P.S. Only 12K printer buffer can be used with Wordwise & WW+, due to the way they are written).
- Unique facility to turn ROMs off and on again.

Only £49

Commander Joystick

Features:

- Direct connection to BBC Analogue input port – no interface needed.
- Fully compatible with all BBC Joystick controlled games programmes.
- Switchable springs allow selection of floating or centring operation.
- Trim adjusters for both X and Y axes for fine centre adjustment.
- Convenient stick mounted fire button with additional base buttons.

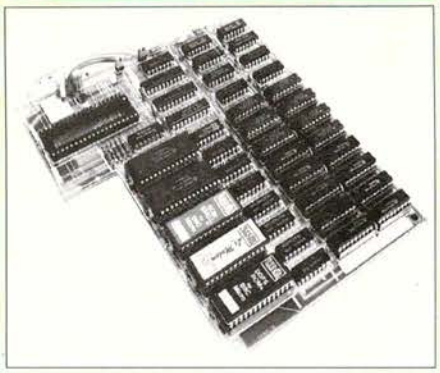
Price: £15

(PC version of above joystick available at **£16**)

Voltmace Joysticks

Delta 3B Single Joystick	£10
Delta 3B Twin Joysticks	£15
Delta 14B Single Joystick	£11
Delta 14B/1 Adaptor Module	£12
Transfer Software Disc-Tape	£7
Delta-Cat A mouse eliminator Joystick for the Archimedes	£24
Analogue aircraft style yoke Joystick to run in the analogue port of the BBC B & Master 128	£25

ROM/RAM Card



- No Soldering required to fit the board.
- Compatible with BBC B
- Total number of ROMs increased from 4 to 8.
- Up to 8 banks of sideways RAM (dynamic).

PRICES:

• ROM/RAM card with 32k DRAM	£39
• ROM/RAM card with 64k DRAM	£52
• ROM/RAM card with 128k DRAM	£83

OPTIONAL EXTRAS:

• 16k plug-in Static RAM kit	£8
• 16k DRAM for Upgrade	£13
• Battery backup	£3
• Read and Write protect switches	£2 each
Complete ROM-RAM card with all options fitted	£109

Surge Protector Plug

Fitted in place of your normal mains plug, this device protects your equipment (and data from corruption), against mains high voltage translent spikes/surges caused by lightning or thermostats switching.

Protection for only **£8.50**

4 Way Mains Distribution Socket

4 way top quality mains trailing sockets.
Supplied wired up with mains plug ready for use.
Can be screwed to floor or wall if required.
Very useful for tidying up all the mains leads from your peripherals.

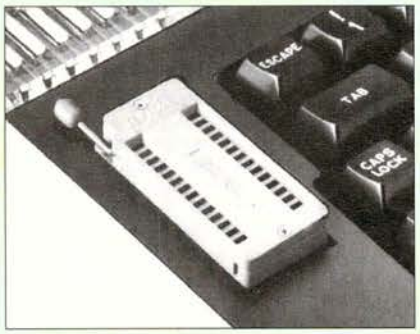
£9.50

Aries Spike Cleaner Unit

A 4 way mains distribution unit as above with a built-in Surge Arrester, providing protection for your complete Computer/Hi-Fi System

£16

Sideways ROM ZIF Socket System



Allows you to change your ROMs quickly and efficiently, without having to open the lid. The ZIF socket is located into the ROM Cartridge's position. It is very simple to install. No soldering required. Also included in the price is a plastic see through storage case with antistatic lining, which allows you to store 12 ROMs.

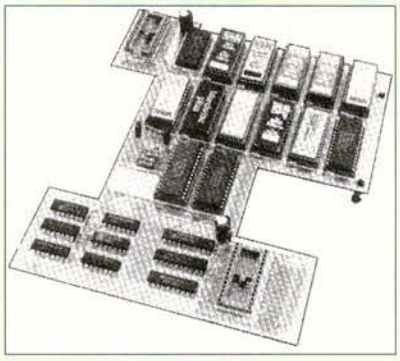
£18

ROM Cartridges for the BBC Master

Will accept the larger Piggy Back ROMs like Interword, Quest, etc.

• Twin **£8;** • Quad **£13**

Solderless Sideways ROM Socket Board



- Increases your BBC Micro's ROM capacity from 4 to 16.
- **No soldering required.**
- Socket 14 takes two 6264 RAM chips.
- Read protect to make RAM "Vanish" allows recovery from ROM crashes.
- Battery backup option for RAM chips.
- Supplied ready to fit with comprehensive instructions.

Price: Only £32

Battery Backup fitted **£35**

Battery Backup only **£3**

16K Sideways RAM **£8**

- Sideways RAM Utilities Disc for Solderless ROM Board. Includes the options to load and save ROM Images and the facility to use Sideways RAM as Printer Buffer.

Only: £8

Disc Drive Power Leads

Supply from BBC power supply to standard Disc Drive Connection: Single **£3.00;** Dual **£3.75**

Disc Drive Interface Leads

BBC to Disc Drives Ribbon Cable
Single **£4** Twin **£6**

Miscellaneous Connectors

	Plugs	Sockets
RGB (6 PIN DIN)	50p	75p
RS423 (5 pin Domino)	70p	80p
Cassette (7 pin DIN)	40p	95p
ECONET (5 pin DIN)	35p	50p
Paddles (15 pin 'D')	150p	250p
Disc Drive Plug 4 way	100p	–
6 way Power Connector	120p	150p

Watford DATA DUCK

Convert two single Disc Drives into one Dual Drive with this simple external unit (Suitable for Disc Drives with PSU. For Disc Drives without PSU, you will also require Watford Power Duck, see below).

£14

Watford POWER DUCK £8

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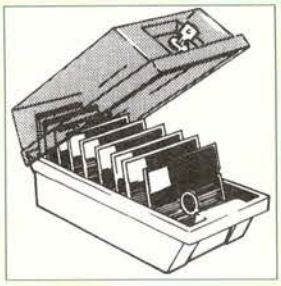
(0923) 250234 or 233383

All Prices Exclusive of VAT

Antistatic Lockable Disc Storage Units



- **M35** – holds up to 50 5.25" discs **£4.95**
- **M85** – holds up to 95 5.25" discs **£6.95**
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* Not lockable

Disc Plonker Rack

When using ones micro, there is a tendency to have more than one Disc on the desk. This exposes them to the hazards of fingerprints, scratches, dust, coffee and an untidy desk. Why not protect your valuable data from all these hazards with the help of our extremely handy and low cost DISC PLONKER RACK. Holds up to eight 5.25" discs.

Protection at Only: **£2**

3M – Diskettes

Lifetime warranty on 3M Discs

- *10 x 5.25" S/S D/D 40T (744)* **£5**
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- *10 x 5.25" S/S D/D 80 Track (746)* **£7**
- *10 x 5.25" D/S D/D 80 Track (747)* **£7**
- *10 x 5.25" 1.6M D/S D/D High Density for IBM XT and AT* **£8**
- *10 x 3.5" S/S D/D 40/80 Track* **£6**
- *10 x 3.5" D/S D/D 40/80 Track* **£6**
- *10 x 3.5" Double Sided High Density* **£11**

Top Quality Diskettes

Watford's life time guaranteed disc are supplied complete with self stick labels & plastic library case.

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- *10 x **M9** 3.5" D/S High Density* **£10**
- *10 x **M4** 5.25" S/S D/D 40 Track* **£5**
- *10 x **M5** 5.25" D/S D/D 40 Track* **£5**
- *10 x **M7** 5.25" D/S D/D 80 Track* **£6**
- *10 x **M8** 5.25" D/S H/D Hi-Density* **£9**
- ***M2** 3" Double Sided* ***£2.50** each*

Special Bulk Offer Discs

(Lifetime warranty on Discs)

BULK PACK DISCS in lots of 100

Type	S/S 40T	D/S 40T	D/S 80T
• Without Sleeves 5.25"	£25	£30	£35
• With Sleeves 5.25"	£28	£33	£38
• 3.5" D/S D/D	£21 for 50	£39 for 100	
• 3.5" D/S H/D	£40 for 50	£75 for 100	

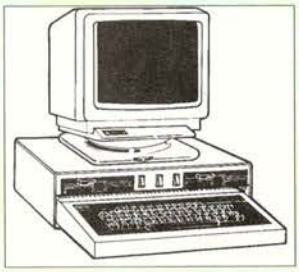
3.5" Disc Drive

These top quality 3.5" Double sided, 80 track, are attractively finished in BBC beige. They are supplied complete with all cables and a Utilities Disc.

Type	Description	
	Disc Drive without PSU	
• **CLS35:**	Single Disc Drive, 400K	£59
• **CLD35:**	Twin Disc Drives, 800K	£109
	Disc Drive with PSU	
• **CS35:**	Single Disc Drive, 400K	£82
• **CD35:**	Twin Disc Drives, 800K	£126

(P.S. CS35 is supplied in a twin case with a blanking plate to enable easy expansion to a dual drive at a later stage)

Disc Drives in Monitor Stand



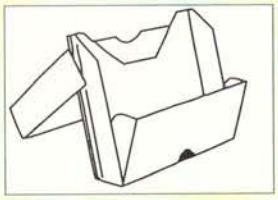
• **CDPM 800S** – Twin 5.25", 800K Double sided 40-80 track switchable disc drives mounted in an attractively finished Beige colour plinth for the BBC B & Master 128K micros. Supplied complete with integral power supply, cables and Utilities disc. The mains switch with neon On/Off light indicator, and the two 40/80 track switches are mounted on the front panel for ease of use.

£165

• **DP35 800** – Same as above except, one disc drive is a 5.25" and the other is 3.5".

£154

Plastic Library Cases



DLC1 –	Holds 5 x 3.5" Discs.	£1.50
DLC2 –	Holds 10 x 3.5" Discs.	£1.90
DLC3 –	Holds 5 x 5.25" Discs.	£1.60
DLC4 –	Holds 10 x 5.25" Discs.	£2.00

Disc Albums

Attractively finished in leather-look PVC Vinyl

DW1 –	Holds 6 x 3.5" Discs	£2.50
DW2 –	Holds 6 x 5.25" Discs	£3.00
DW3 –	Holds 20 x 5.25" Discs	£3.50
DW4 –	Holds 40 x 3.5" Discs or 5.25" Discs	£4.50

Floppy Head Cleaner Kit

The heads in floppy drives are precision made and very sensitive to dirt. The use of Cleaner Kit is a sensible precaution against losing valuable data. It is recommended to clean the drive head once a week. it is very simple to use. Available in 3.5" & 5.25", please specify.

Price £4

Acorn & Watford DFSs

- Watford sophisticated DFS ROM **£16.00**
- Watford DFS Kit complete **£49.00**
- DFS Manual (comprehensive) **£6.95**
- Acorn DNFS ROM **£17.00**
- Acorn ADFS ROM only **£25.00**
- Acorn 1772 DFS ROM Kit **£49.00**
- Acorn DFS Kit complete **£48**

Watford's MkII 1772

Single/Double Density DFS

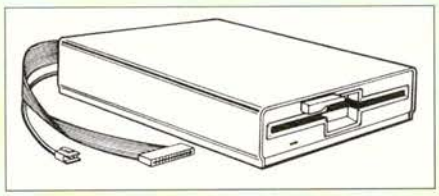
Many of our customers have wanted to use our superior DDFS and Acorn ADFS together. Now our Mk II DDFS Board with its 1772 Disc Controller, has been adapted to allow the use of Acorn ADFS as well. It also has all the commands of the Acorn's 1772 DFS, plus many more added features.

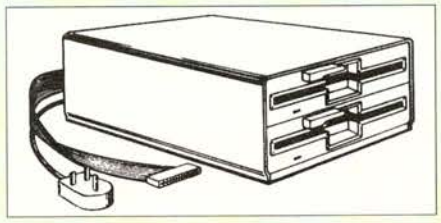
- Complete Kit Special Price **£44**
- DDFS Manual (No VAT) **£6.95**
- We will exchange your existing DFS Kit for our sophisticated DDFS for only **£26**

Quality Disc Drives from Watford

All our Disc Drives are Double Sided and will operate in both Single and Double Density modes. All 5.25" Disc Drives are 40/80 track switchable. For ease of use, the switches are front mounted. Follow the trend with a Watford plinth. (Turn to the 6th page of our advert for the Plinths).
P.S. All our 5.25" Disc Drives with PSU are compatible with the Compact Micro. All you require is our special Compact Disc Drive cables designed by us.

"Test Bureau Approved for Use in Education"





Our Disc Drives conform to BS415

Type	Description	
	Disc Drive without PSU	
• **CLS400S:**	Single, 40/80 track 400K Double sided Drive	£70
• **CLD800S:**	Twin, 40/80 track, 800K Double sided Drives	£138
	Disc Drive with PSU	
• **CS400S:**	Single, 40/80 track, 400K Double sided Drive	£80
• **CD800S:**	Twin, 40/80 track, 800K Double sided Drives	£149

Special Cable to connect both 3.5" and 5.25" Disc Drives simultaneously to the BBC Compact £13

Continued→ → → → → → → → →

Computer Concept's ROMS

Inter BASE	£49
Inter CHART	£25
Inter SHEET	£37
Inter WORD	£36
Mega-3 ROM	£76
Spell Master	£42

Wordwise plus

£40

We are giving away absolutely **FREE,** the superb Word-Aid ROM worth £24, with every WORDWISE PLUS package bought from us.

Word-Aid

This advance utilities ROM extends the power of your Wordwise plus ROM.

- Alphabetical sorting of names and addresses.
- Text transfer options.
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- Epson printer codes function key option.
- Search and display in preview mode.
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- Multiple file options for print and preview.
- Address finder.
- Label printer.
- Mail-merger.
- Number/delete/renumber.
- Clear test-segment area.
- BBC B, B+ and Master compatible.

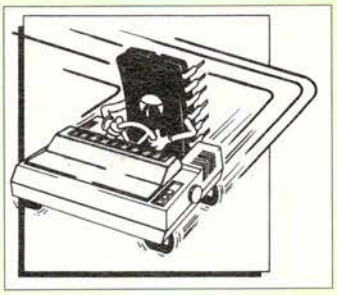
Only **£24**

(N.B. Word Aid requires a Disc interface in your Micro)

Acorn ROMS

View 3.0 ROM	£45
Viewsheet (Acornsoft)	£36
Viewstore	£36
Viewspell – 80T disc	£25
View-Index	£12

View Printer Driver ROM



View is a powerful word processor, but it seriously lacks in terms of printer driver support. With the View Printer Driver ROM, the View users will find themselves in the realms of advanced word processing.

Price: Only £29

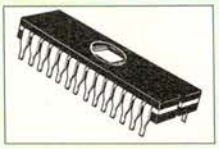
Mini Office 2 – Disc

for BBC B & B+ **£12**

(When ordering please specify for which Micro & 40 or 80T Disc)

All prices exclude VAT

Assorted ROMS



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ACORN BASIC 2 plus User Guide	£22
ACORN DNFS	£17
Acorn OS B+	£25
Acorn OS 1.2	£14
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Master ULA (47)	£15
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Numerator – BBC	£39
Pendown ROM	£32
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Watford Electronics' New High Tech Computer Boutique is now open in Luton. Don't miss your chance to visit the Acorn and Watford Villages.

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Acorn Speech Synthesizer package complete, for the BBC B Microcomputer

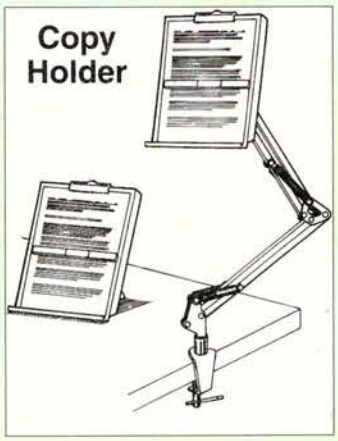
Special Offer £14

User Port Splitter Unit

Gone are the days when you had to plug and unplug devices from the User Port. This extremely useful little device allows two units to be connected to the User Port simultaneously, and select between them simply by toggling a switch. This device is particularly useful for those people using Quest Mouse and the Watford Video Digitiser or any similar combination

Excellent Value at **£22**

Copy Holder



Whether you want to type in your latest program or the draft of a new trilogy, Watford's manuscript holders are superb for holding your paper at the ideal height and angle to allow you to read and type in ease and comfort.

Available in 2 full A4 versions, desk resting and shelf clamping. Paper is held firmly by means of a plastic retaining ruler and a clip grip.

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Angle poise **£12**

NEW Copy holders as above but with a battery operated, remote controlled cursor/ruler. (By hand or foot pedal.) (Batteries 2 x AA not included.)

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EPROMs need careful treatment if they are to survive their expected lifetime. Over erasure of EPROMs very rapidly turns them into ROMs!
The TEX erasers operate following the manufacturers specifications to give the maximum possible working life by not erasing too fast.

- **ERASER EB** – Standard version erases up to 16 chips. **£34**
- **ERASER GT** – Deluxe version erases up to 18 chips. Has automatic safety cut-off to switch off the UV lamp when opened. **£36**
- Spare UV tubes. **£12**

ROM Extraction Tool

This extremely useful tool allows you trouble free chip insertion and removal from your computer by distributing the removal force over the whole body of any 24 or 28 pin chip. **£2**

Metal Chip Extractor **£3**

Servisol Foam Cleaner

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Go faster stripes

Mike Goldberg introduces you to the delights of masks and bank switching

WHO was that masked man? To that there was never an answer but there is when adding a mask to your own sprites and then plotting them. So now let's look at how to make your sprite plotting more exciting.

Last month we created a sprite called *SmallOne* and plotted it from a Basic listing. We also plotted a lot of unwanted pixels too in the shape of a rectangle that outlined the extent of the sprite.

Getting rid of those pixels is easy – just make a mask the same shape as the unrequired pixels, see Figure I, then save the sprite with the mask as *SmallTwo*. To plot the mask along with the sprite is a matter of altering one variable only.

Look at last month's listing **DrawIt** line 290 and alter the variable *howplotted%* to 8 and change the sprite name at line 330 to *Smalltwo*. By adding 8 to the normal plot codes includes the mask so no great mystery there. Simple isn't it?

Once you have plotted a sprite with its mask and assured yourself that's all there really is to it try using some of the built-in effects. Add line 325:

```
SYS"Os_SpriteOp",256+33,area%,"Smalltwo"
                          |
                        Flip sprite
```

When you run the program the sprite is plotted upside down – to flip it about the Y axis substitute 47 instead of 33. Now it is printed back to front – in layman's terms.

Now if that was not enough let's see how all this can be plotted even more speedily. If we alter the string name of our sprite to just a memory address number the computer doesn't need to search to find the right sprite so plots it quicker.

Look at the listing **AddressIt**. Using another OS call at line 290 selects the sprite you wish to address. Note the three commas after the TO. You can see here we are altering our string *SmallTwo* to an integer variable called *spritetwo%*.

The next line reads the sprite's width and height – again note the syntax. It is not necessary to use the variable names *width%* and *height%*, any unused variables will do. So to plot it look at line 390. The first thing to notice is that the 256 in the OS_Sprite call has changed to 512 which just means we are providing the address of the sprite not its name.

The other is that the string *SmallTwo* is replaced with the integer variable *spritetwo%*. When you run this program there will be no discernible plotting speed difference. However, when plotting lots of different sprites, rubbing them out, replotting a background and putting the sprites back in as you would in a game listing, the speed increase is quite visible.

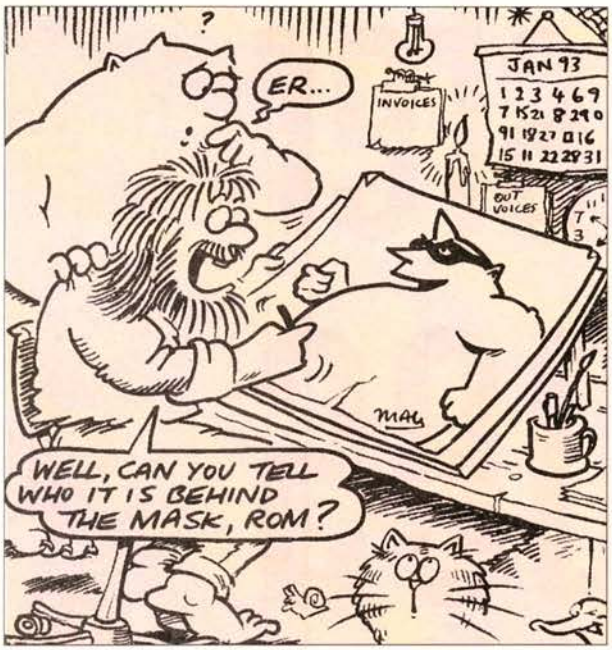
Believe me now: You will regret writing a long listing that plots sprites by name as I first did – use memory addresses because converting it over becomes a task akin to mucking out the Aegean Stables.

Which brings me neatly round to plotting a sprite over a background, then moving it and leaving the ➤

● *Fill in the block with a transparent mask to lose the rectangle outline*

Mike Goldberg is a professional illustrator who's been creating games for the BBC Micro and more lately, the Archimedes since 1982 – he was one of the Ms in the immensely successful games company MRM.

He has written many of the best type-in games for *The Micro User* and recently created Dream Quest for the Arc. He still owns an Electron and two BBC Micros as well as a big cat.



background intact. On the old Beeb this was quite a complicated machine code process.

The background that the sprite was placed over had to be stored in memory. The new coordinates of the sprite would give you the next piece of background to store while the original background was replaced to screen. Then the sprite would be plotted in its new position.

It required a very convoluted piece of coding that I spent years perfecting, only to get an Archimedes which obviated the need for any machine code. Typical but nevertheless very handy and a thousand times easier.

Because of the phenomenal processing speed of the Arc you can actually reprint the whole of the background and then the sprites on top each time you want to move something.

As well as that you can draw on more than one screen at a time – the idea being to draw all the sprites on the screen that is not visible and only display it when the drawing is complete.

Repeat this process and you get seamless animation. Don't be put off by articles you may have read about only using 16 colour modes because they are quicker – you can do amazing things in any mode so why waste all those 256 colours? Some people want jam on it!

Anyway, the procedure I'm talking about is called Bank or Screen Switching and we will use a mode that use 40k to map the screen, Mode 9, to keep things simple.

This is because each bank or screen in Mode 9 needs 40k of memory to map it and if your machine is like mine, you will not have to alter the screen memory allocation on the Task Manager if the default is 80k (Mode 12) and you only want to use one extra bank or screen.

From that, there really is only one command you now need, in two forms and here it is:

```
SYS 6,112,screenbank_number%
        |                |
        Select screen    |
                         Screen number

SYS 6,113,screenbank_number%
        |                |
        Display screen   |
                         Screen number
```

SYS is a System command and SYS 6 followed by two variables allows you to select a screen bank to write to and which screen bank to actually display. This can be a bit tricky to get your brain round initially but familiarity soon sets in if not through dogged perseverance alone.

I've provided an example of how straight forward this command is to use, see listing **Animate**, all you have to do is create three Mode 9 sprites preferably one called *Backg* for the background and two more *Rom0* and *Rom1* and save the spritefile as *ROMfile*.

Looking at the listing it is always a good idea to do a CLS on both screens otherwise you can get all sorts of discarded junk on the screen.

So line 370 and 380 selects screen banks 2 and 1 and clears them in that order. This saves you selecting the default screen again which is 1. Then a couple of variables: At line 440 *bank%* which is the bank we are writing to or displaying and at line 450 *whichROM%* which of the two images of Rom we are printing.

Line 510 alternates between 1 and 2 for switching to the correct screenbank number and line 520 does similar for the Rom image. Then 550 selects the screen bank not being displayed and 580 draws the background to it, line 590 draws the sprite over that and 620 switches the display to this invisible screen and displays it.

As all this loops between lines 480 and 640 the bank switching cycles between 1 and 2, 1 and 2 and so on. The result is quite breathtaking certainly on first acquaintance.

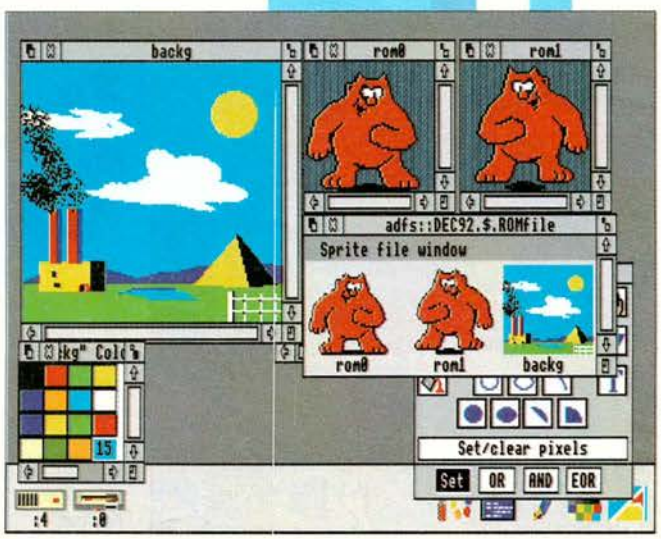
You could always incorporate a WAIT in the listing to wait for the screen to refresh but in practice all this does is slow things down needlessly.

It is often far better to sacrifice total *electron microscope proof* smoothness for the increase in speed and usually the increase in speed means you don't notice much jerkiness or sprite *tearing* anyway.

Beeb users will remember the oft-quoted smoothness solution of *FX19 which did exactly the same thing: Crank the animation speed down to unbearably slow.

So there you have it and it's all waiting for you on your machine. The speed is there just dying to be unleashed and the commands are there too, if you know where to look. Well look no further!

● *Next month we'll scale the heights (and depths) of sprite scaling and a whole slice of software scrolling – make room for your portion now.*



● *Create three sprites to do the animations*

NOTE

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All stop in space

The CyberDoc explores satellites that don't appear to move

IT was only about 30 years ago that the first live TV pictures were sent from America to Europe. Pretty useless they were too, because the satellite that reflected the signals was only in the right place for a few minutes because it was zooming around the Earth at thousands of kilometres per hour.

These days, we can get live pictures from most places in the world at any time of day or night. This is not because there are thousands of satellites up there: It is because these days space scientists can put a craft into a *geostationary* orbit – *geo-* means Earth.

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● *So now you can see how satellites can hang in the sky. Next month I'll explore another interesting scientific idea.*

```
  10 REM Orbits
  20 REM The CyberDoc
  30 REM (c) Acorn Computing
  40 MODE1
  50 PROCsetitallup
  60 VDU19,2,4,0,0,0,0
  70 REPEAT
  80 IF INKEY-103 S%=10:L%=400
  90 IF INKEY-104 S%=50:L%=200
 100 IF INKEY-99 S%=30:L%=300
 110 PROCdrawit
 120 UNTILO
 130 ENDPROC
 140 DEFPROCsetitallup
 150 S%=30:D%=0
 160 R%=300:L%=R%
 170 VDU23,255,153,90,36,195,195,36,90,
153
 180 VDU19,1,2,0,0,0,0
 190 VDU19,2,4,0,0,0,0
 200 VDU19,3,1,0,0,0,0
 210 VDU29,640;512;
 220 PRINTTAB(0,1)"> - speed satellite
  < - slow satellite"TAB(5,2)"space - ge
o-stationary orbit"
 230 VDU5
 240 ENDPROC
 250 DEFPROCdrawit
 260 R%=L%
 270 FOR N%=0 TO 330 STEP S%
 280 GCOLO,3:MOVE SINRADN%*R%,COSRADN%*
R%:VDU255
 290 TIME=0:REPEATUNTILTIME>50
 300 GCOLO,0:MOVESINRADN%*R%,COSRADN%*R
%:VDU255
 310 MOVE SINRAD(N%-90)*100,COSRAD(N%-9
0)*100
 320 FOR P%=D%-90 TO D%+270 STEP 30
 330 IF P%<D%+100 GCOLO,1 ELSE GCOLO,2
 340 MOVEO,0:PLOT85,SINRADP%*100,COSRAD
P%*100
 350 NEXT
 360 D%=(D%+30)MOD360
 370 NEXT
 380 ENDPROC
```

GET IT RIGHT

```
 10 =    0 0
 20 =    0 0
 30 =    0 0
 40 = EA3A A
 50 = D5FA 8
 60 = B181 8
 70 = BFBA D
 80 = 9921 4
 90 = C768 2
100 = BDD5 E
110 = B298 8
120 = 53CE 7
130 = EDOF 9
140 = 8042 5
150 = FFC9 B
160 =  F11 8
170 = AA93 1
180 = 93F3 C
190 = B181 D
200 = 1E04 D
210 = D818 0
220 = FCEB 9
230 = 667A 3
240 = EDOF F
250 = D219 4
260 = 6128 6
270 = FD42 0
280 = 5B82 2
290 = 45FE 6
300 =  E08 5
310 = F899 E
320 =  898 F
330 = 9913 E
340 = 89AA 4
350 = 2C83 E
360 = 1053 E
370 = 2C83 3
380 = EDOF 7
```

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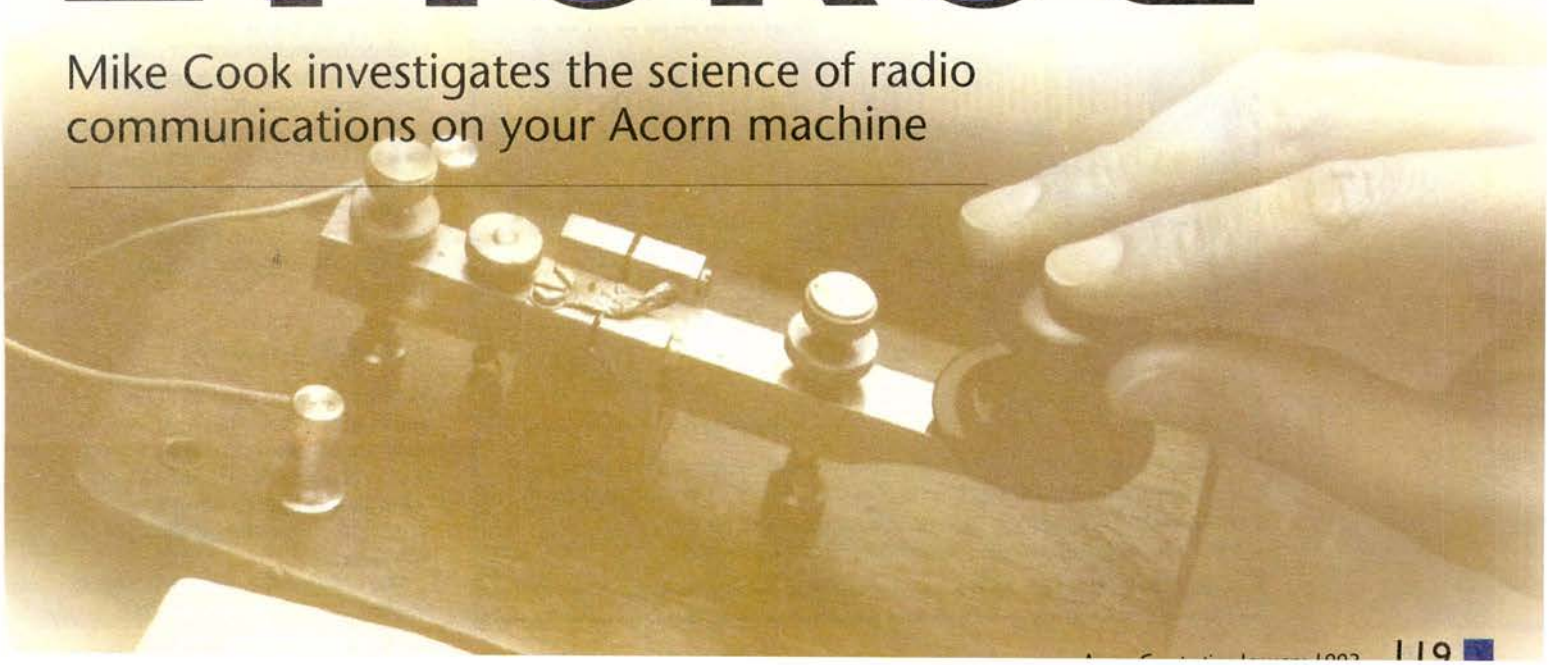
Inspect a MORSE

Mike Cook investigates the science of radio communications on your Acorn machine



SOMEONE at an Acorn road show mentioned to me that I had not written any projects concerning radio. This reminded me that these were on my original projects list some 10 years ago but somehow never got tackled. Well I am going to rectify that this month by looking at how our computer can make sense of Morse code.

This project, in the true Body Build sense is open ended and there is lots of scope for added sophistication. It makes an excellent start for any educational based project and is suitable for all models of Acorn computers.

There is a plaque in Port Merion – the place where *The Prisoner* was filmed – attributing the invention of Morse code, not to Samuel Morse, but to his assistant Cook.

Apparently Morse was somewhat of a man about town but he had the money which is why he got the credit. As far as I know the true inventor is no relation.

Nevertheless, Morse code is still widely used today on the short wave radio bands and is a requirement for an amateur radio licence for frequencies below 30MHz. From a computer point of view the problem with Morse is that it was not designed with a machine in mind but a human operator.

As such it has no rigidly defined timing and is what is known as a scarce packed code, that is, not all available combinations are used. While no computer can match a good human operator at reading the stuff, it can certainly better *my* attempts at reading it. So let's see how it is constructed.

Dah dah di di

Morse consists of a sequence of dots and dashes, dots being short and dashes being long. Notice there is nothing specified: The short something can be sound, light flashes, blinks or even prods in the side, but for convenience let's think of them as tones.

The timing specification says that a dash shall be three times longer than a dot, but as a dot length can be anything and it is sent by humans this is very loosely interpreted.

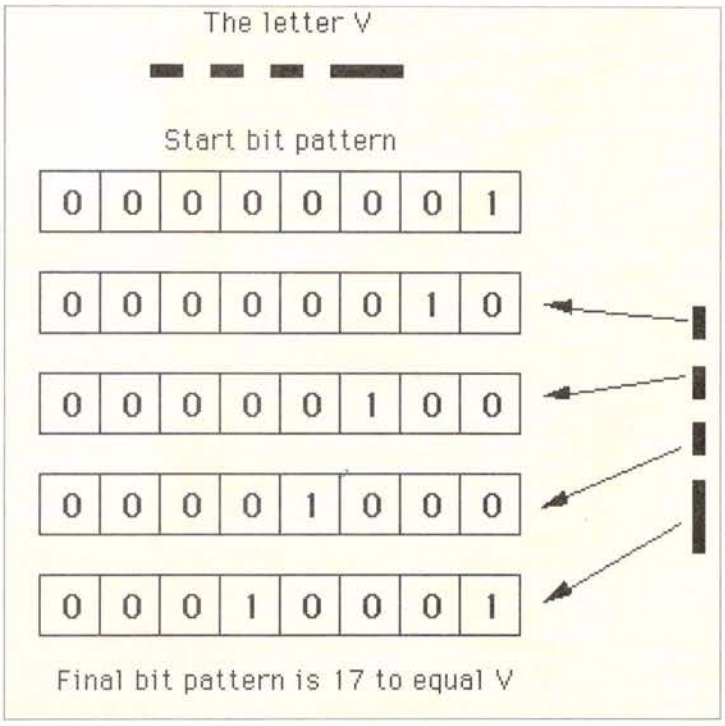
A sequence of dots and dashes makes up a single character or letter, and here we have the first problem, the length of the sequence is not constant. It ranges from one (for E or T) to six for one of the numbers.

You are supposed to tell that a group has come to an end when the space between dots and dashes is as long as a dash. So the first problem is that you don't know you have reached the end of a letter until you have reached the beginning of the next.

Also if the space is longer than five dots, this represents the end of a word and we should have a space. This is very flexibly interpreted and the biggest problem any computer system has is knowing when to put in a space.

You might think it is convenient to represent dots as logic zeros and dashes as logic ones, and so it is, but it is a little more complicated than this. You see you can only put a one ➤

Mike Cook is a senior lecturer in Maths and Physics at Manchester Polytechnic. He has written over 100 articles and is the only person to have had something published in every issue of *The Micro User/Acorn Computing*.



● *Figure 1: Building a received character set*

or zero in a computer byte. Suppose you had a byte of all zeros – does it contain one dot, two or eight?

The solution

There are many solutions to this but mine is to have a *guard* one at the start of the byte, that is an empty byte containing 0000 0001. Now when a dot or dash come along you simply move the bit pattern one place to the right and add the new character.

For example if we have a dot arrive followed by a dash we would get 0000 0101. You will get the idea by looking at Figure I. This shows the Morse character V which by coincidence is the rhythm for the opening theme to Beethoven's Fifth Symphony. We need to make up a table of what bit patterns we receive correspond to what letters. This is shown in Figure I.

Now, when we have decided that we have got all the dots and dashes that make up a character we can use a look up table to get the Ascii equivalent to print to the screen.

However, before we can do this we have to decide whether we have a dot or dash coming into our computer. Inputs are logic levels that change from high to low, and in order to find if we have a dot or dash we have to time how long our input is high and then compare this with some sort of threshold value.

In addition because we have a code that can be sent at any speed we need some way of changing this threshold to lock on to an incoming signal and to compensate for speed changes. There are a number of strategies we can use but the simplest one goes as follows.

If we have received a dot make the threshold one and a half times the time we have received. On the other hand if we have decided we have just received a dash we make the threshold half the received length. In this way we will lock on to the speed of the signal, at the longest, when we get one dot and one dash. In some situations this locking on is too quick and subject to being thrown off course by interference. We will see later how this can be avoided.

So the only part we have not covered in the overall scheme of things is how we get the dots and dashes into our computer, in the form of long and short bursts of sound.

There are many ways to do this but perhaps the simplest from a construction point of view is to use a Phase Locked Loop (PLL) tone decoder. A PLL is in fact quite a complicated circuit and years ago it took many individual integrated circuits and other components to construct one.

Phase locking

It's such a useful circuit however, that now you can get them all one one chip at a very modest price. The function of a PLL is to run a voltage controlled oscillator so that it runs at exactly the same frequency as an external signal.

Its block diagram is shown in Figure II. The output of a voltage-controlled oscillator and the external or reference signal are applied to a phase comparator. This produces a voltage output proportional to the phase difference between the two signals.

That voltage output is then filtered and fed back in a loop to the input of the voltage controlled oscillator. If this oscillator is of a different frequency to the reference, the voltage from the phase comparator will make the oscillator change frequency until it matches. When this occurs we have said to have achieved lock.

We can see if we have achieved lock by looking at the voltage going into the voltage controlled oscillator. We can use PLL for all sorts of applications from frequency synthesis to low level voltage amplifiers.

Incoming tone

Here we want to use the PLL to detect whether we have an incoming tone and pass that on to the computer. The NE567 PLL is optimised for performing tone detection and is almost ideal for the task here.

The only snag is that although it will run off 5 volts it is much

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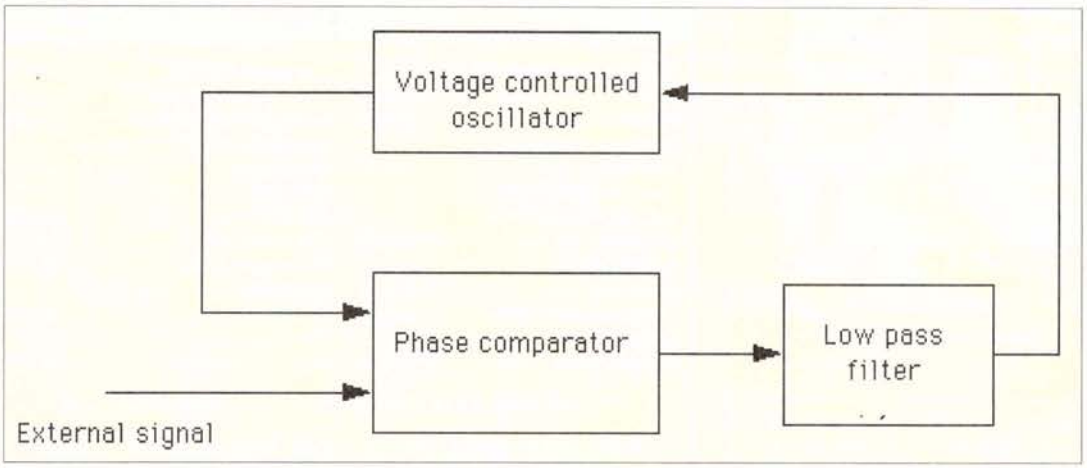


● *Figure 2: The principle of a Phase locked loop*

happier running off a higher voltage.

Fortunately it does not require a very regulated supply and so it can run off a 9 volt battery. On the other hand you could get slightly better results running it from the 12 volts available from the auxiliary power socket from the Model B or Master.

The circuit of the decoder is shown in Figure III, as you will see we need only a few components to complete the circuit. As we are not feeding it from 5 volts we need to reduce the voltage before we can feed it into the computer, this is best done using a transistor.

Also as a tuning aid there is an LED which will light up on detection of a tone. It needs to be fed with about 0.2 volt of audio, this can be derived from the radio's auxiliary output or from across the speaker.

You can get all the parts as Body Build pack No. 82 – the circuit is built on veroboard and a layout is included with the kit. However, next month we will look at a filter and amplifier for the front end and that circuit will be combined with this months on a PCB so you might want to wait for that.

Beat Frequency Oscillator

In order to use this circuit you need a suitable type of radio receiver, that is one fitted with a BFO (Beat Frequency Oscillator). Morse code is sent by turning a transmitter on and off – this signal mixes or beats with the BFO to produce an audio tone.

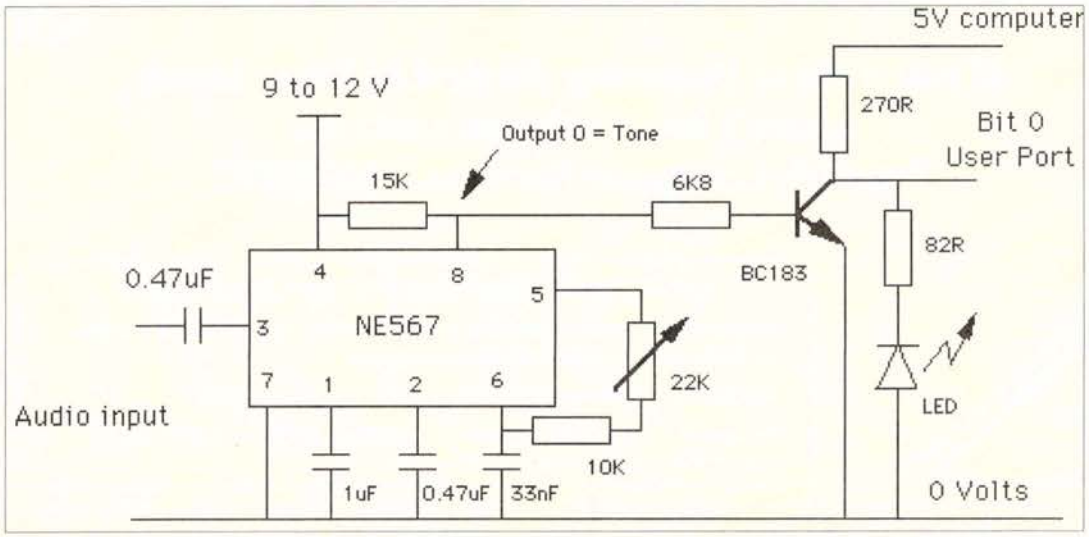
By changing the BFO you can change the frequency of this tone, you have to adjust this to exactly the PLL frequency. When this is done the LED will flash in time to the tone. If this the tone is not matched to the PLL or drifts off the LED will still flash but not cleanly in time with audio.

You can adjust the lock frequency of the PLL with the potentiometer but I wouldn't recommend adjusting this in normal operation, it is much better to adjust the BFO. By the way the BFO on the radio must be stable so that you can read the signal for a reasonable length of time.

Now we have to feed the PLL tone decoded output into the computer. On the 8-bit computers this is a simple task as we can use the User Port. Also if you have the input/output podule for the 32-bit machines you can use that in a similar way.

On this month's subscription disk are programs for both machines. If you haven't got a podule, hope is not lost, as we shall see next month when I look at what you are likely to receive, how to improve reception and how to connect up the other Acorn computers.

In addition there will be a program to turn your computer into a Morse code generator to test the decoder and maybe even teach you how to decode it with the best computer of all, the one between your ears. Have a Merry Xmas and a Happy New Year.

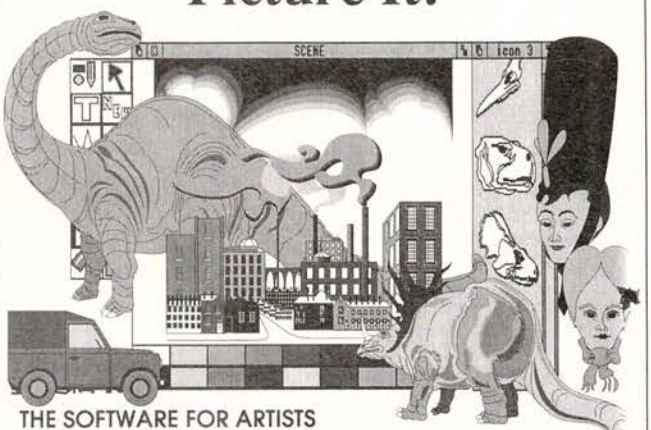


● *Figure 3: The Morse receiver interface*

Ascii	Morse
E	2
T	3
I	4
A	5
N	6
M	7
S	8
U	9
R	10
W	11
D	12
K	13
G	14
O	15
H	16
V	17
F	18
L	20
P	22
J	23
B	24
X	25
C	26
Y	27
Z	28
Q	29
5	32
4	33
3	35
2	39
+	42
1	47
6	48
=	49
/	50
(	54
7	56
8	60
9	62
0	63
?	76
"	82
,	83
.	85
'	94
-	97
)	109
:	120

● *Ascii equivalents to received Morse bit patterns*

"Picture It!"



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Any key to restart

HacMan 2 continues his fresh-look hints and cheats for Acorn games

THE postman could barely carry the burgeoning bag of readers letters up my front garden path this morning. He cast a long shadow over my humble dwelling as he approached – I had to open the door for him before he got them all through my letter box or he would have been late for the rest of his round.

We are thinking of expanding HacMan into a six page feature. Cosmic. I got eight letters. One of those was addressed to the Mad Hatter. Another was an electricity bill. Do something, you lot, or I'll be pensioned off before I really get going. With the wealth of games being released this Christmas all you fiendish hackers should have a great time hunting out those cheats, so send 'em in.

And if you have any problems playing those wondrous new creations just let me know and I'll give you the mega-cheat to blast those baddies. Remember, dear reader, it's you and me against those evil programmers.

Super cheat spectacular

Party on, dudes, here's the best letter this month to arrive in HacMan's World: Nathan Atkinson from Stockton-On-Tees wrote in with some excellent cheats. In Chuckrock, he explains, on the screen with the band type *ERMINTRUDE* for immortality and *PINKYANDPERKY* for flying. Use the F key to fly.

While playing S.W.I.V. pause the game and type *NIGEL* press Return, pause it and you have infinite lives. If you want practice playing Nevryon, when the demo starts press *P* and then fire.

On the Lemmings password screen type IAMNOTGOOD. Thereafter when you are playing you'll only need to press space to proceed directly on to the next level. Finally, Nathan includes the Lotus 2 passwords which are: DARK SKY, FOGY FOG, ICELAND, CACTUS, MANIAC, DAMP PATCH and CLOUD BURST.

Thanks, Nathan.

Cheats anonymous

S. Briggs from Somerset mentioned in his letter that most people say that before hacking a game around to perform some 'cheat', it is wise to take a backup copy. This is indeed true, and it is good advice.

He does point out, though, that many games are copy protected and thus this is not possible. True, but mainly in the case of Beeb games as the trend for Arc products is to use some other method of protection, such as passwords from the manual or user-registration.

Although copy protection causes inconvenience to legitimate users of games, I fully understand the need for software houses to do this. The Arc market for games is not really that big yet, and when all the costs involved in developing a game are incurred it can be very difficult for the authors to make any money.

In fact, it can make development of a game commercially unrealistic. Software piracy is theft, but more importantly it puts a strong upwards pressure on games prices, and reduces the number of new games coming on to the market.

So next time you make an illegal copy of your fave game for a friend, remember that the next one you buy could cost you £10 more – and it'll be your fault.

➤

Totally fervourish

I have been playing Fervour from Clares quite a bit, and think it's great. Here are the first 25 passwords for the Beginners' levels.

Level	Passwords	Editor Passwords	Level	Passwords	Editor Passwords
1	Level0	EasyPeasy	14	Compress	Expand
2	Simplicity	Complexity	15	Scramble	Ringmatic
3	LemonSqzy	Assembler	16	Life	Automatic
4	NeedTime	GotTime	17	Patrimony	Moraine
5	UpAndDown	AndBackUp	18	Barcelona	FreddieM
6	Silhouette	Hurricane	19	Remember	Awarded
7	VeryWhite	AppleWhite	20	Banana	Redraw
8	Plausible	Coordinate	21	Andrew	Hersee
9	BitJerky	NotToBad	22	Window	Philosiphy
10	Repertory	Inception	23	Torque	Protrude
11	ILoveBends	DoYou	24	Illustrated	Archimedes
12	Shower	Irritate	25	Reversed	WellDone
13	Copula	Tapestry			

The Games Wizard

Leading Edge have recently announced their new games cheater program which was designed and developed by Vertical Twist. The Games Wizard is a software implementation of the Atari and Amiga devices which allows games to be manipulated while they are running. The latter devices are hardware add-ons and therefore cost quite a bit more than the Acorn one.

Briefly, The Games Wizard will typically allow you to find passwords, add extra lives, slow the game down by any amount, save screen shots and jump directly between levels. All operations are carried out while the game is actually running. The program works on Archimedes with Risc OS 2 and above, and at least 1MB of memory.

Although undoubtedly a fine piece of technical programming, I am a little unsure about it. Surely most of the fun of coming up with games cheats is the hunt itself? The reward of finding that special key sequence, or password? Telling your friends about them? Sending them into me?

I have not seen a copy of the Games Wizard yet so we'll just have to wait and see whether this new idea takes off. Leading Edge can be contacted on 0532 458800.

Last Ninja in fight to death

A frustrated James Foster from Solihull keeps getting killed on the Last Ninja, at the dragon on level one. Not to be put off, he also keeps getting killed on Last Ninja 2 (odd title – a bit like *The return of the end of the world*) near the three buildings where you need a gammer to go up.

Well the dragon's easy you just have to throw a certain item so it hits him on the nose – I'd have put salt on his tail – as for Last Ninja 2, someone else can help on that, over to you boys and girls.

Oh no! More Lemming passwords

I am eagerly waiting for those new Lemmings passwords you lot, so get saving those little blighters. Quick.

Bits and bobs

B. Ahmed from Southall wrote in saying that the infinite lives cheat for Acornsoft Hits 2 game Labyrinth (on tape) in the July 1990 edition does not work. Well now that may or may not be true ... we all know how tricky typing in those cheats can be, so did anyone else find a problem with it?

I have been finding that the monitor saver on RISC OS 3.1 causes much irritation when playing some games. There is nothing more infuriating than being halfway through some complex manoeuvre when suddenly someone switches the lights off! Time for Acorn to come up with a fix, me thinks.

Totally bad

Seen Acorn's TV and newspaper ad campaign? Well if you hop along to your nearest Acorn Open Day you'll be able to pick up lots of lovely Acorn goodies at low-low prices;. Fancy a Totally Bad T-shirt, well they got 'em. Plus totally serious Acorn mugs and a few other bits and bobs. I reckon Acorn should bring back Archie, their totally bad teddy bear.

My pick of the year

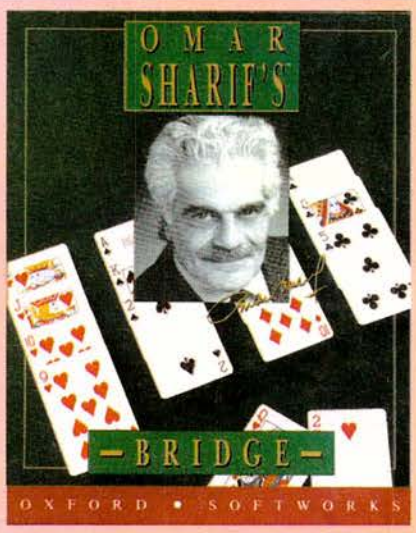
● Lemmings, which needs absolutely no introduction from me. Anyone who is not familiar with the game by now must have been living on another planet for the last 12 months. Although launched for the Arc last year, Krisalis have just finished converting another 100 levels for your enjoyment. This must be a classic game if ever there was one.

● Populous is in my opinion one of the most welcome games to be released this year.

Converted from the PC version and totally original in concept, this mind wrenching simulation forces the player to control the game by manipulating the elements rather than the on-screen characters themselves. See the cover disk this month!

● Fervour was previewed last month, and a cut-down version appeared on the cover disk. I think that this game must be one of the very best in terms of addictiveness and gameplay and I can barely keep away from it long enough to finish this column. And it gives our Editor vertigo. Clares should supply a safety belt with each one.

● Omar Sharif has unexpectedly found his way into the pages of the Acorn press – I must admit he is the last person I expected to see, except perhaps Mrs. Briggs from down the road. Not being a Bridge player myself I don't know whether the program plays a good game, does anyone else?



Yet more car racing games have found their way into the Arc market this year, too. I'm beginning to find it difficult to remember all the names.

Next year should see another batch of PC conversions - and hopefully some original games too. Black Angel from The Fourth Dimension seems to be following along much the same lines as Karma Release 2 – in release delays and one or two other ways.

Anyway, that's your lot for this month. Have a good holiday.

AND THEN THERE WERE THREE

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Looks good, fee

EVERY now and again you may have read a review only to see screenshots of the Desktop with different icons for the Task Manager, Palette, floppy and hard drives and perhaps thought to yourself: *That's not my computer, is it?*

Well yes it is, it could be a different model of the Archimedes range, but it is the same machine, and this article will show you how to design and replace the standard icons.

The standard icons are referred to as the system sprites, and they are stored in an area of memory called the shared wimp sprite pool.

This is split into two: The rom area and the ram area. The former holds all the sprites resident in rom (standard sprites), while the other area is where replacement, or new system, sprites are stored. The ram area isn't a permanent storage area.

● *The file access window benefits from 3-D icons*

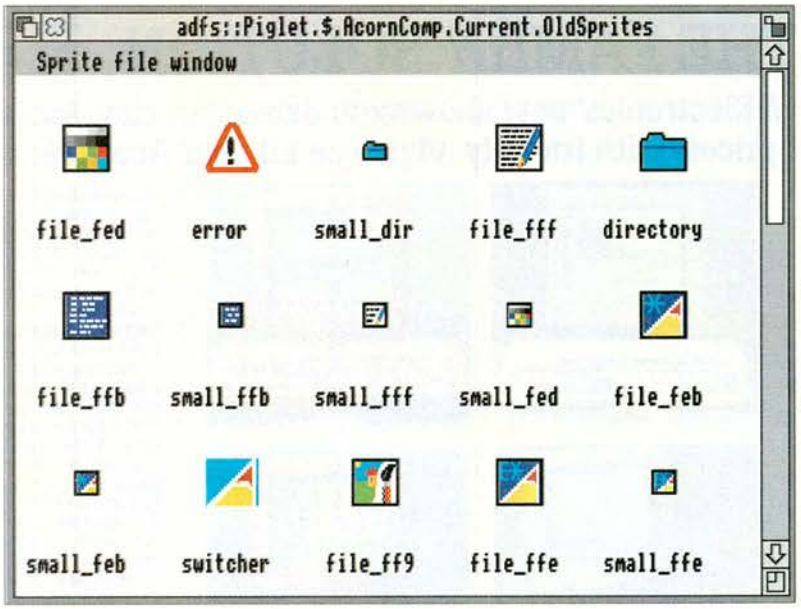
But you don't need to know all that to be able to replace the system sprites.

You will be able to replace icons for the Task Manager, floppy disk, hard disk, palette, every file type that exists, the options, radio, directory, application, network, fileserver, error and the ram disk icons – phew!

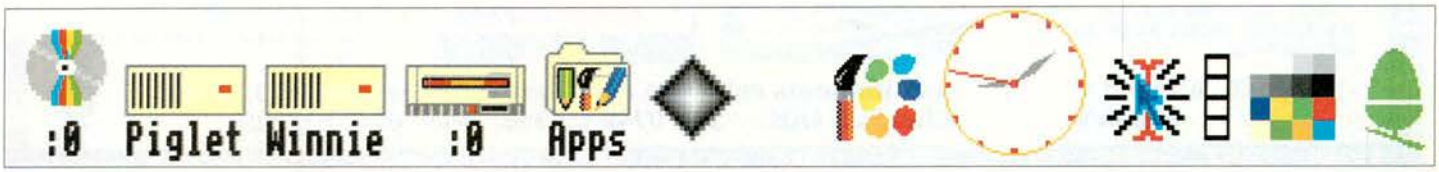
As Cilla would say, worra lorra icons. You will also be able to change the mouse pointer shape, but beware it can't be more than 32 pixels wide. And you don't have to redefine each and every system sprite, just the ones you want.

On this month's subscription disk is a file containing all the standard system sprites. There's also an array of new replacement sprites you can use – they are all separate, so you have a sort of pic 'n' mix.

Just drag each new sprite that you want into an open window in !Paint and then save the whole spritefile – it doesn't matter what the filename



● *The whole set of Risc OS 2 system sprites*



● *A Risc OS 3 icon bar with additions – is this your computer?*

Is great

Is your desktop boring? If so then Paul Louth has the answer

is. Or you can design a new set of sprites yourself – the important thing is to maintain some continuity of style.

Icon do it

Once you've got your new sprites together you must issue the command *IconSprites* providing the new sprites have the same names as the ones you are trying to replace, you will be alright. But if you spell the name wrong you will not get an error message, so if it doesn't work check the names.

To issue the command press F12 then type:

```
IconSprites adfs::MyDisk.$.MySprites
```

though the file name will be different for your files. Then press Return twice to get back to the DeskTop, and if any of the new icons are on the screen you'll find they've been replaced. Once you know that your sprites work it would be better if they loaded automatically.

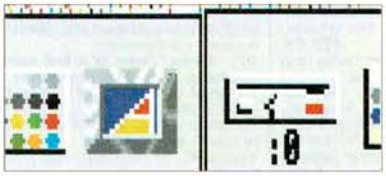
You don't want to type commands every time you use your computer – it ruins the fluid feel of a desktop environment and returns to the idiosyncrasies of command line input.

But luckily enough there is a very easy way of executing commands automatically.

First you need to create an application directory – you could call it !Replace. To do this you have to click menu over the directory viewer of the disk you want it saved on, then access the sub-menu called *New directory*.

Now type in the name of the application. It doesn't matter what it's called as long as it begins with an exclamation mark (!). Finally press Return.

Now hold down Shift and double-click on the application you've just created. This opens up the directory instead of trying to run the application – you'll get a *File not found* error if you don't hold down Shift.



● *A few of my favourite icons*

Drag your new sprites file into the directory and using the Filer menu rename it as !Sprites. Now when the computer next catalogues that directory it will load the sprite file automatically and replace the system sprites on the next screen update.

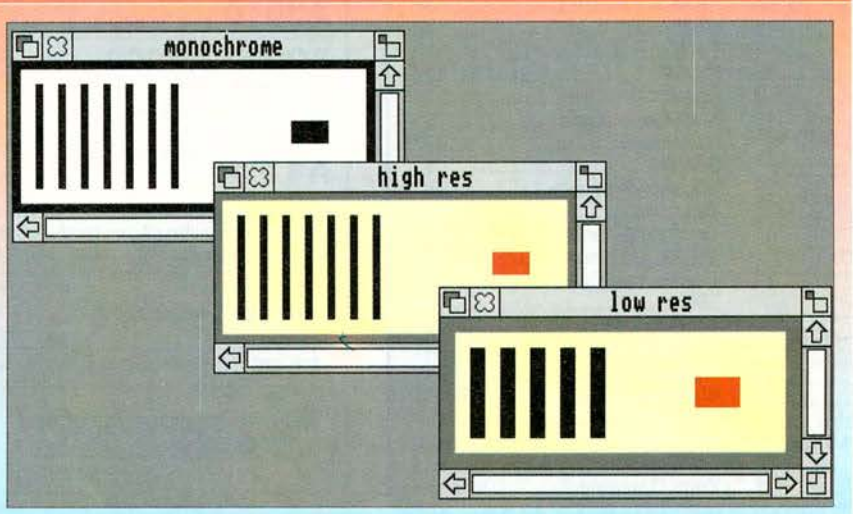
● *So now you can customise your sprites to look just the way you want them. If you're feeling really perverse you can define all the icons as being the same, or perhaps all blank, but now it's up to you.*

There's an array of replacement sprites so you can just pic 'n' mix

High resolution sprites

So far we've only looked at sprites for Mode 12 Desktops. Now these are fine but if you use a high resolution mode such as Mode 31 you can get a lot more detail. As you can see from the comparison of the hard disk icons – the monochrome option is for the very high resolution Mode 23 screen.

In an application directory you can have three sprite files – !Sprites (low resolution), !Sprites22 (high resolution) and !Sprites23 (mono) – so if you're feeling enthusiastic you can do the whole lot three times.



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Share and share alike

Mike Cook solves another sack load of queries

AS MY major project for my A-level Technology course I am committed to designing and building an automatic printer sharer for a single printer and at least four micros.

I have the basic idea but my problem is the best way to alert the processor within my project to an incoming signal from a computer – which pin is used and what voltage is used? Also could you tell me what function the strobe pin performs? I have been unable to find out anywhere.

I would appreciate your advice as all previous research on this particular problem has been useless. – **Paul Wilson, Keighley, West Yorkshire.**

● *The strobe line is a signal from the computer to the printer telling it that a byte of data has been transferred. This is only produced when the printer is not busy – indicated by the busy line.*

Therefore, to make a printer sharer you need to look in turn at the strobe lines for each computer. When you find that one of them is at a logic zero switch that computer through to the printer – switch the data lines strobe and busy lines using data select chips like the 74LS153 or 74LS155 for busy.

When there has been no activity on the strobe lines for about four seconds – use a NE555 missing pulse detector circuit to do this – you can begin scanning again.

It would look nice if you have a seven segment display showing the printer currently connected through or the one being scanned.

I built a similar device for an eight-computer printer sharer about nine years ago but there is no point is giving you the circuit – even if I could find it – as that would not leave you with much of a project. Best of luck with your design.

8in driving

IN response to R. Barton's questions (*Acorn Computing* October 1992), I know of several successful cases of 8in drive conversion.

The original BBC Micro had links 4, 10 and 27 which were permanently tracked for 5.25in drives but the alternative settings were for 8in – in particular the 8271 clock rate was doubled. Full use of this would require a filing system designed for 77 – larger – trackers.

An alternative is to treat the 8in drive as an 80 track 5.25in. Most 77 track disks will stretch to 80 track, but in my drive the U-shaped head would not reach in far enough. The cure was to cut a narrow strip off the edge of each disk jacket, next to the access slot.

8in disks revolve at 360rpm instead of 300. One way to accommodate the same track data is to raise the clock rate by at least 20 per cent – assuming the filing system can keep up. I chose instead to slow the drive down allowing a 5.25in drive to be connected as well.

With a 50Hz spindle motor, a 60Hz pulley and belt will conveniently reduce the speed to 300rpm. Otherwise, you can fashion a pulley with tubing and sticky tape but you might need to move the motor to maintain the belt tension.

You can count disk revolutions if you listen carefully. A monostable on the drive is triggered by the sector holes to determine whether the drive is up to speed and it never will be. You need to locate the mono – with an oscilloscope – and increase the time constant by 20 per cent.

The actuators and so on need +24V at around 1.5A and a crude supply will often suffice. You might squeeze a transformer, rectifier and electrolytic capacitor into the drive chassis but watch those nasty mains terminals. A manual switch will prevent the spindle motor whirring continuously, or better still an ➤

AGENDA

- 8in disk drives
- Monitor lines
- Changing the screen border
- Dismantled BBC
- 40 and 80 track formats
- Printer sharing
- Interrupted digitiser

Monitoring problems

I HAVE an A5000 connected to a Taxan 795 monitor and to a LaserDirect 4 printer. My first problem concerns the monitor: While giving an excellent display on most accounts – the loss of a few old games that won't work is unfortunate – about three-quarters of the way down the screen is a thin black line that stretches all the way across the screen.

It does not disappear when I change modes and fiddling about with the monitor's controls also makes no difference. To me it looks like the monitor is missing a whole line of pixels and it's starting to get on my nerves. Shall I go back to my supplier, or Taxan or leave it?

Secondly, when I run the PC Emulator version 1.8 in EGA or VGA modes, PC games and some programs only use a quarter of the screen. Why does this happen and is there any way I can make the display use the full screen?

Lastly, do Acorn realise that the facility to change the screen border colour within the palette doesn't work? Or is it just my computer setup? – T.G. Riches, Worcester.

● *Most Trinitron colour monitors have this black stripe across the screen – it's a 'feature' of Apple Macintosh displays. It is a potential equalising strip designed to produce a better convergence in the tube.*

I am afraid that the only solution, short of changing the monitor, is to try and ignore it. It may help to change the colours to minimise it. It did annoy me but now I have to look carefully to see it.

With the PC Emulator sometimes it is necessary to experiment with the display configuration options to get the optimum results on certain programs. This is due to the vast number of options available in the very non-standard PC world.

Finally the screen border should change with your computer. However, you need to be in one of the modes that do not take up the whole scan – like Mode 15. The multisync modes cover the whole screen so there is no border to change.

It is just possible that your monitor is taking the border to be the black level and therefore locking on to that. It that is so the border will stay the same but all the other colours will change.

isolated electronic switch controlled by drive select 0 or 1 – 50-way pin 26 or 28.

The +5V input typically draws around 1.3A. Some drives need a -15V supply at around 0.1A, sometimes alterable to -5V by a link removing a regulator.

The Beeb's 34-way connector should be connected to the top 34 pins – 17 to 50 – of the 8in drive's 50-way connector, except for the following:

- Beeb pins 2 and four unconnected unused
- Beeb pin 8 goes to 8in pin 20 index hole signal
- Beeb pin 16 goes to 8in pin 18 load head
- Beeb pin 32 goes to 8in pin 14 side select

The cross-overs will be at the 8in end or on the drive itself, so you can still fit a 5.25 connector part-way along the cable. As usual the terminator must be fitted and the drive-select link must be set.

A final hint – my own drive won't work within a foot of a colour monitor. **–Toby Williams, Christchurch, Dorset.**

● *Thanks for your help, most of this rings ancient bells. I know of at least three people who will be most anxious to get an 8in drive working.*

You can write to Mike Cook c/o Acorn Computing, Europa House, Adlington Park, Macclesfield SK10 4NP.

He will answer any questions about difficulties you are having with your machines, mainly those to do with hardware. If you want a personal reply ensure that you enclose an SAE with your letter.

Custom and exercise

I SENT my BBC B for repair from Spain to a well-known firm near London. But on its return the repair label showed as *Electronic parts for test gear.*

When it reached the border my computer was almost completely dismantled by the customs officers, with every nut and bolt together with one long black lead and one half length red lead left loose.

I managed to reassemble it except for the red lead which I believe was snapped off from a contact labelled VCC2. Since then I haven't been able to use my tape recorder. I tried re-soldering to the VCC2 but it didn't work. **– J.C. Bird, Fuengirola, Spain.**

● *I think the reason that your returned computer was labelled that way was to prevent you from paying import duty on something you had already paid duty on.*

But your customs officers have been very malicious and I suspect that you would have a good cause for a claim of criminal damage against them. But you would have to check with a lawyer.

In the meantime you want to use the tape facility. I suspect that the – 5V line is not connected up to your board. This is the purple wire coming out of the supply and attaching to the left hand edge of the board about 3 inches up from the corner.

80 into 40 may go

I HAD difficulty verifying a client's 40 track disk. I kept reformatting and filling it with PD science software until I remembered someone saying that 80 track disks reformatted as 40 track were sometimes awkward.

The solution was to wipe them clean with a ring magnet from a discarded TV set and then reformat them. It worked perfectly. **– C. A. McGaughey, Canterbury, Kent.**

● *The thing to remember here is that a 40 track head covers twice the area of an 80 track head. When you use an 80 track head in 40 track mode you leave half the area of the disk unchanged.*

This is fine as long as you continue to use a double-stepped 80 track head. However, once you switch back to a 40 track head it will be reading half new information and half old. This inevitably leads to difficulty in reading.

With a fresh disk or one erased in the way you describe there is nothing on the other portion of the track and so a 40 track head can usually cope with only having half the signal.

Digitising updated

I MET you at the Watford Open Day last year and was one of the many who asked whether your digitiser could be used on the Archimedes. I had been using it on my old BBC Master 128 when you first published and built it in 1985. Now I own an A3000 I would still like to use it.

Therefore, I was delighted to come across your article updating the software for the Archimedes. Unfortunately, after typing in the program and checking it against the checksum, it crashed my computer.

The line causing the trouble is:

```
1010 SYS 6,151,&6E,&98 : REM E
NABLE CONTROL LINE INTERRUPTS
```

I have also established that, once this SYS call has been made, it will only cause the computer to crash the minute I connect the video out to the digitiser.

If I leave the video disconnected the program will work fine except of course for the fact that there won't be any picture to digitise. The program runs without this line – when the video is connected – but won't produce a clear picture.

Unfortunately I have no idea how to control a user port or how to program Sheila so I would be grateful for your help. I use Acorn's Midi/User Port podule on my A3000. **– Jim Imossi, Gibraltar.**

● *I think your problem here is that the input/output expansion card is passing on an interrupt to the ARM processor. On the older 8-bit machines this was hardwired in but on the cards there is a link to provide an optional connection.*

The video digitiser needs to use the edge detection capabilities of the VIA but does not require the computer to service an interrupt. On the 8-bit software this was done by disabling the interrupt in software.

It's rather more complex on the 32-bit machines and so you are best not passing the VIAs signal to the ARM. The link is normally by default not made. Check that this is the case with your card.

Slow drives

I WAS complaining to a friend that my BBC Master 128 and Pace PDD3 5.25in double disk drive take a long time particularly as I use programs which use the disk intensively – InterBase, ViewStore, DAFT and so on.

He looked up a star command which should increase the speed of the drive. So I tried *FX255,0,255 and found little difference. Do you have any ideas what I could try next? – Mike Newman, Bristol, Avon.

● ***The *FX255 call only takes affect after a break and the Advanced User Guide is very misleading about this. What you want to do is to type *FX255,207,0 press Return and then hit Break. This sets up the head step and settle times to the minimum.***

Not all drives will work fast and if you want a permanent solution, look at the bottom right hand corner of the keyboard PCB. Here you will find a row of links all unmade.

Start from the left-hand end and make the third and fourth links. You'll need a soldering iron and a small piece of wire. By the way the fifth link reverses the action of Break and Shift+Break allowing you to always perform a Shift+Break on power up. The last three links control the display mode on power up.

Skyfall

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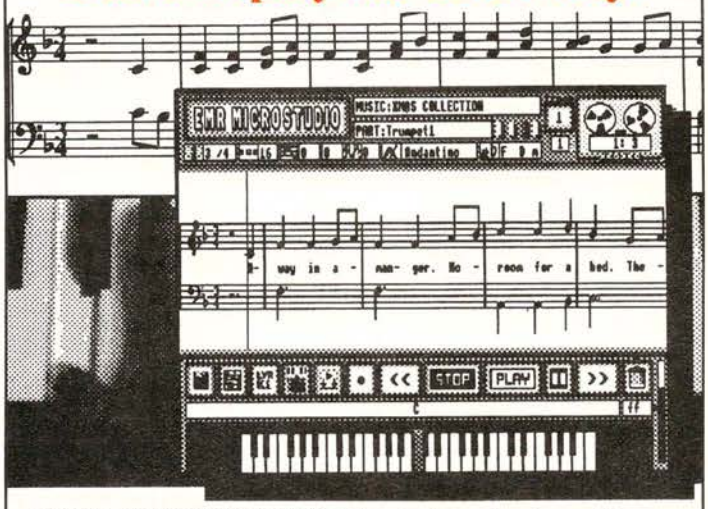

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Editing the basics

John Allen (MSc DIC ARCS) moved into journalism after researching interactive computer simulation. John has been programming and using computers for over 20 years. He is a former BBC Radio Science Producer and now producing Mike Carlton's *Morning Report* on LBC Newstalk.

In addition he regularly writes and broadcasts about computers and is the author of *Z88 Pipedream: A Dabhand Guide.*

PRODUCT SPOTLIGHT

Product: DeskEdit 2
Price: £31.95 (£9.95 upgrade) inc VAT
Supplier: Risc Developments, 117 Hatfied Road, St Albans AL1 4JS.
Tel: 0727 40303

AS useful utilities go, the original DeskEdit has been at the top of my list for over a year. It is a text editor that mimics Acorn's Edit but has many extra features providing a convenient working environment for programmers in Basic and C.

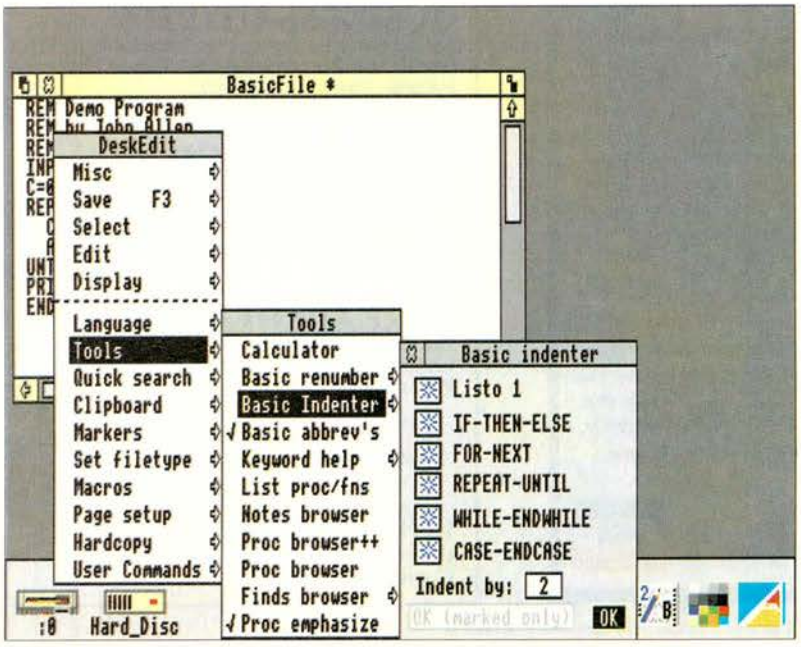
Version 1.2 was reviewed in the October 1992 issue of ***Acorn Computing*** and now there's a new version, DeskEdit 2.

It is natural to compare it with Edit which comes as part of Risc OS. In Risc OS 3 Edit has been improved so that it can edit Basic programs and it now has a search system more like that in DeskEdit.

Basic programmers will particularly notice the improvements in DeskEdit 2. A new Tools menu provides facilities which are otherwise only available at the Basic command line, like renumbering, automatic indenting of loops and the ability to use keyword abbreviations.

Among the new tools provided is a Calculator which – for setting window flags or assembly language programming – is a real plus.

Numbers can be entered in decimal, hexadecimal or binary form and displayed in the others. It can import numbers from a document and export the results of calculations back to it. Both arithmetic and logical operations can be performed. Very neat, soon you will wonder how you ever did without it.



● *Lots of new tools are now available*

Save and load

DeskEdit now has an option to do extended file saving, that is save a file such that when it is reloaded everything is restored to exactly the same state as when it was saved. This includes the page setup information, the cursor position and any markers.

It can also include the last 5k's worth of history in the Undo buffer, allowing mistakes to be recovered later. The extra data is saved as a separate file in a *DeskEdData* directory.

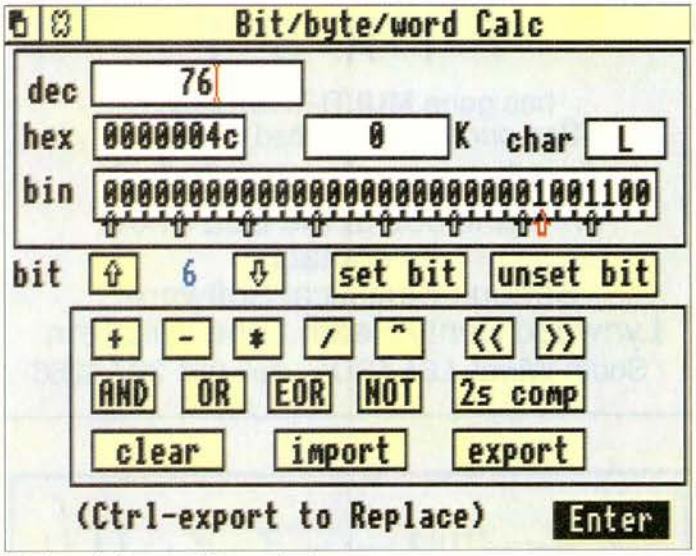
There's a new way to find a string in the editor, by using browser windows. This process is initiated by pressing F2 instead of the normal F4, used to locate a string. A new window is displayed containing all of the lines in the document which include the required string. Clicking Select over a particular line in the browse window moves the cursor to the corresponding line in the main window.

Programmers can use a similar mechanism to display the first line of functions and procedures in a browse window, enabling them to move rapidly around different parts of their program.

Keyboard short-cuts

Like most Risc OS applications, DeskEdit has a comprehensive menu system, but is also has an

John Allen takes stock of the latest in text editors, assessing the latest version of DeskEdit



● *The calculator tool is a real winner*

● *Browsing is a new way to find a string in the editor*

enormous number of special key combinations, some of which duplicate menu operations

Others – generally Control or Escape combinations – provide handy short-cuts. Fortunately there's a reference card with this version of DeskEdit as there are far more shortcuts than any mortal can remember.

A new help facility can be accessed by pressing F1. In Basic mode it gives a handy reference to commands, marking a keyword and pressing F1 gives a window containing notes on the syntax of that command.

Alternatively if no text is marked, DeskEdit supplies a window for a keyword to be entered. No help files are provided in the other modes but they can be created to hold readily accessible notes.

Find – which is an Acorn application – comes with DeskEdit. It scans files, directories or whole disks in a few seconds, finding all occurrences of a specified string.

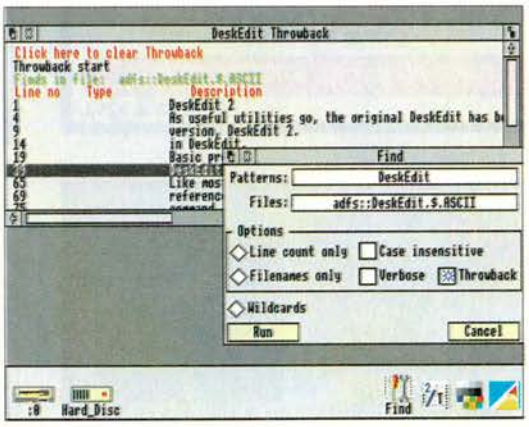
It then uses the throwback mechanism in DeskEdit to display all of the lines containing the text – select a line with the mouse and the appropriate file is loaded into DeskEdit. Throwback is more normally used by C programmers, so this facility is also useful for them.

Summing up

DeskEdit is an essential for Basic programmers who have Risc OS 2 machines, and is useful for many other users. Risc OS 3 users have the enhanced Edit so DeskEdit can no longer be regarded as essential for them but programmers will still find it a great asset.

Edit only provides the most necessary facilities – these are not sufficient to easily develop Basic programs. If you like to tinker around and explore your computer then DeskEdit will make it a lot easier, for a modest cost.

● *Next month John will be taking a look at 4Mation's DBEdit – their new desktop Basic editor.*



● *More common to C than basic programmers is the idea of the throwback*

The great escape

DeskEdit 2 treats the Escape key as another Control key. So it is used in conjunction with the function keys to provide a fifth level of commands, and there are many keyboard short cuts using Escape.

This is a non-standard use of the key which may lead to confusion. Fortunately the Escape shortcuts are unlikely to be needed by the novice user.

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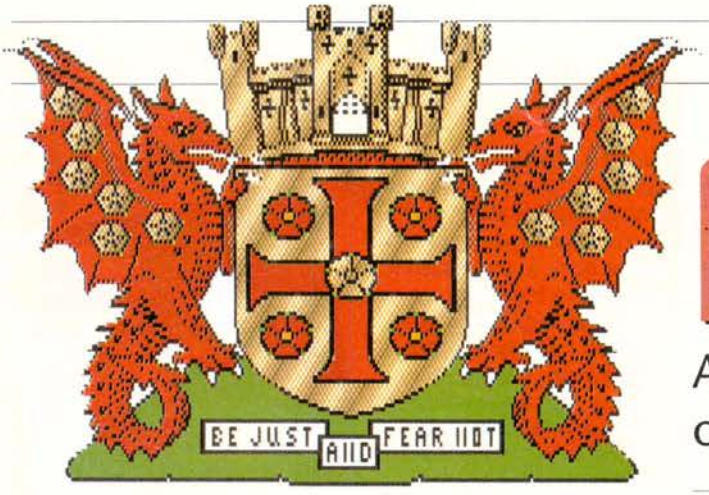

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A historical simulation of the border regions

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Frontier 2000 – the frontier being the one between Scotland and England – was produced in association with Tullie House Museum in Carlisle.

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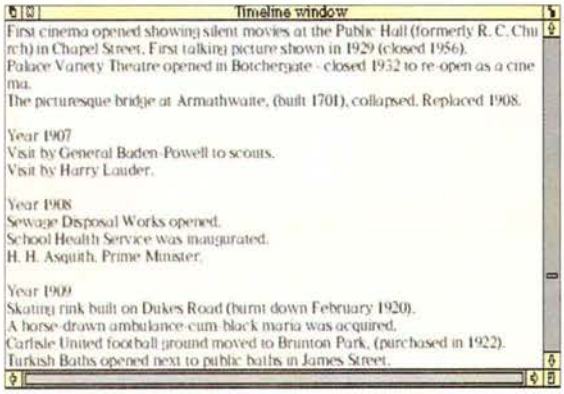

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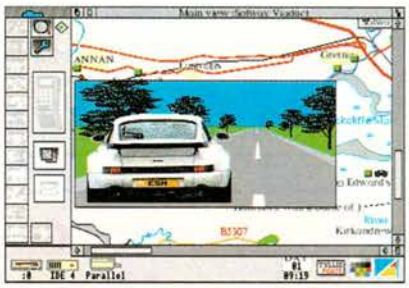

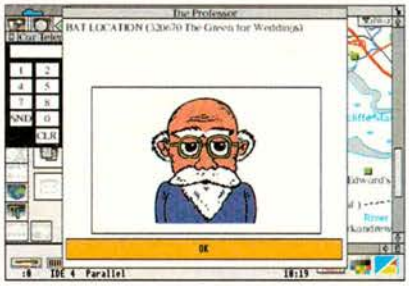

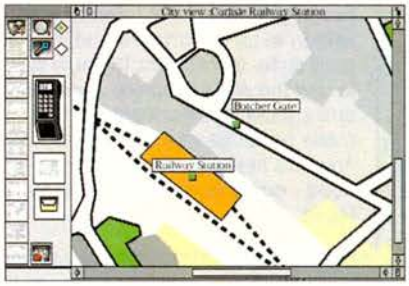

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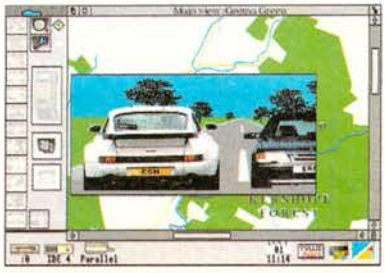

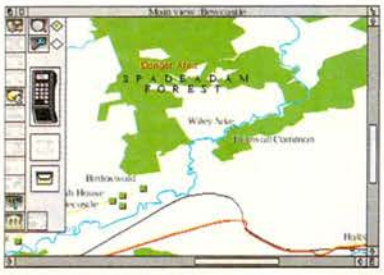

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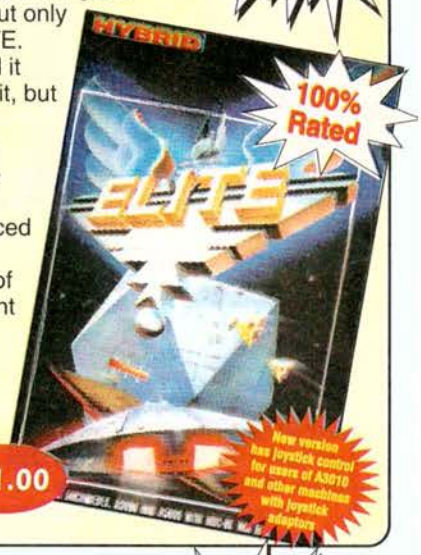

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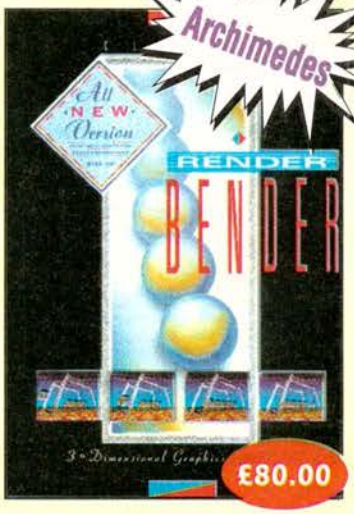

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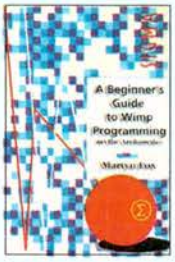

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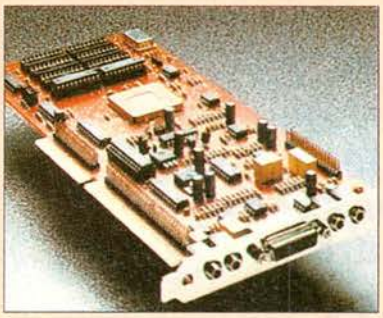

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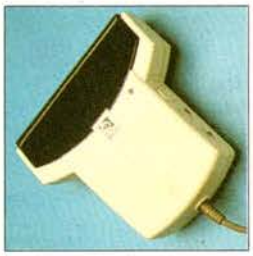

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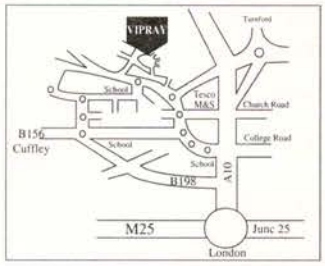

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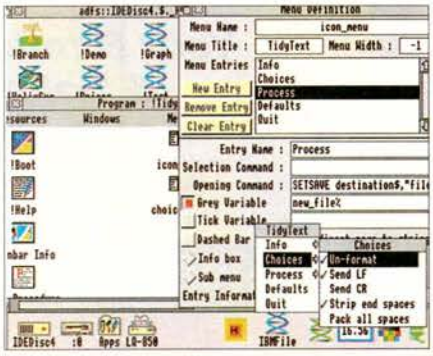


● *Creating menus becomes a doddle*

HELIXBasic is an alternative way to program Wimp applications. This new fully functional enhanced Basic V language interpreter makes programming for the Desktop environment really easy.

Only available for Acorn Risc OS machines, it allows multi-tasking programs to be developed with a minimal knowledge of Basic.

For instance, to start a new application you click on the Helix icon and the essential !Run, !Boot and !Help files are automatically created with their minimum necessary contents. From then on you simply create windows, menus, procedures and functions – a specially written editor – as you need them.

The program editor lets you set up windows and menus particularly easily. Suddenly you have a complete reversal – the hardest part of designing Wimp applications becomes the easiest.

Windows can be attached to other windows to create toolboxes and if the windows are designed with horizontal or vertical scroll bars then these are automatically dealt with by HelixBasic. As windows are also automatically maintained, no redrawing is needed in your own applications.

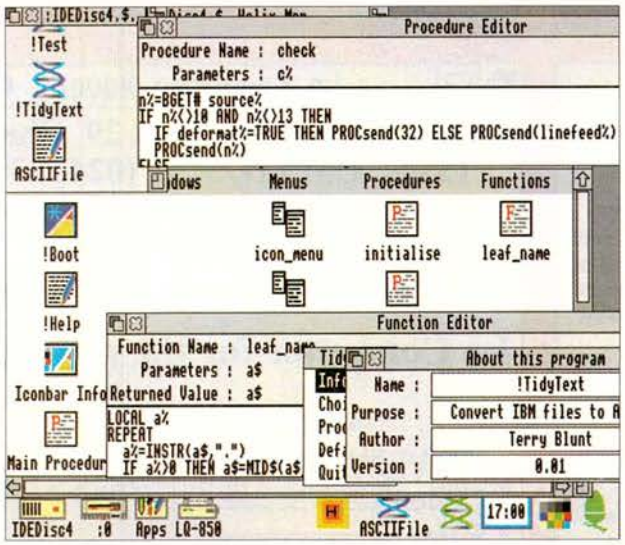
Menus can be defined with procedures, sub-menus, sub-windows, save and info boxes as well as having colour selector boxes attached to them. You can attach variables menu items so if that variable is true the entry is either greyed or a tick appears in the standard Risc OS way.

Taking the variable principle one step further you can have *linked variables* – a feature new to HelixBasic. A variable can be attached to a specific screen item like a button or some displayed text. If the item is altered on screen the change is reflected in the linked variable and when a variable is changed the screen is updated with the new information.

For anyone wanting to delve into programming it's a great starting point and because of this we are starting a series giving you step-by-step help. You can read the first part on Page 65 of this issue of *Acorn Computing*.

Whether you want to follow the tutorial series or want to take advantage of the unique price and save nearly £25, this special offer is an opportunity not to be missed.

HelixBasic normally retails for £99.95 but here at *Acorn Computing* we are offering you the complete package for £75.



● *You can use the HelixBasic editor to make Wimp programming easy*

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Double jeopardy

I AM in the middle of my HND at college where they use high density disks. Does anyone make a second disk drive for the A3000 that can read both double-sided, double-density and high density disks that would run in conjunction with the PC Emulator?

In addition how can I make hard/printed copies of template files? Is there anywhere I can get some technical information on templates? – Steve Holden, Prestwich, Manchester.

● ARXE Systems have been developing a high density drive for some time and it is promised quite soon now.

Unfortunately, you can't print Template files. You can load them into FormEd – the Window template editor – and display each window on the screen. You can then use the snapshot facility from Paint to grab the screen and save it as a sprite file and print.

Technical help on Templates can be found in the Programmer's Reference Manual.

Master update

PRIZE LETTER

I FOUND your Pixel Mapper in the October issue of Acorn Computing to be an excellent combination of programs and can highly recommend it as an invaluable addition to anyone's graphics library.

There was unfortunately one minor drawback. While PixMap will run perfectly well on a BBC B it will not run correctly on a Master 128 in its present form as on the demonstration disk. This is due to the Master's lack of the &280 multiplication table which was in rom at &C375 on the Model B and is accessed in mapcode.

The following program will adjust mapcode *to include the &280 table at the end of the machine code and allow PixMap to access it and so will run on the Master.*

*If the altered code is *SAVEd (line100) under a new file name, rather than overwriting* mapcode *then line 50 in PixMap should be altered accordingly:*

```
10 MODE1:HIMEM=&2C00
20 *LOAD mapcode 2C00
30 ?&2E73=&5E:?&2E74=&2F
40 ?&2E78=&5F:?&2E79=&2F
50 M%=&2F5E:N%=&2F5F
60 FOR L%=0 TO 31
70 ?(L%*2+M%)=(&280*L%)DIV 256
80 ?(L%*2+N%)=(&280*L%)MOD 256
90 NEXT
100 *SAVE mapcode 2C00+39E
110 = END
```

I hope that the above will help other Master owners and allow them to get the same satisfaction from the Pixel Mapper as I have. – **J. P. Dixon, Wakefield, West Yorks.**

Bouquet

I HAD Risc OS 3 recently installed by Fairhurst Instruments of Wilmslow, then experienced trouble with my floppy disk drive. Their engineer located and rectified the fault most efficiently.

The pleasant way I was received and my problem sorted out deserves recognition, so perhaps you can spare the space to include this note in Acorn Computing. – **G. H. Ireland, Manchester.**

Basic steps

I HAVE been a regular reader of The Micro User *since issue one and recently sold my BBC B and bought an Archimedes.*

After reading the article A Man of Letters *by Mike Goldberg in the October issue of* Acorn Computing *I wanted to modify WRITE1 as suggested but I don't know where to start on these 32-bit machines. How I can list programs from the monthly disk?* – **L. E. Martin, Bexhill on Sea, East Sussex.**

● The first step is to format a new disk to use as a workdisk, then give it a suitable name, such as *Work1*. Drag the program from the monthly disk on to the workdisk then look at the title bar of the Filer window it's in. For example you might have:

```
adfs::Work1.$.Write1
```

Press F12 and type:

```
*Basic -load adfs::Work1.$.Write1
```

Basic will start up and the program will load automatically, you can then LIST and RUN the program without leaving Basic. To save you can either do it the long-winded way:

```
SAVE"adfs::Work1.$.Write1a"
```

– add the *a* so that you don't overwrite the original. Or you can do it the easy way by adding a new line right at the start like this:

```
1 REM > adfs::Work1.$.Write1a
```

Now you can just type SAVE, press Return and Basic will use the filename specified in the program.

If you have Risc OS 3 you can double-click the Basic program with Shift held down to load the program directly into Edit, you don't need to mess around with filenames if you do this.

Other options are to use DeskEdit 2 from Risc Developments, DBEdit

Disk trouble

I'M just about to upgrade to an Acorn A3010 LC from the humble Electron. Scanning through many advertisements has made me unsure of which type of disks will format to 1.6Mb.

Could you please explain the difference between high/double density, 40/80track, branded and bulk? – William Taylor, New Milton, Hampshire.

● When disks are manufactured they are tested to see how good they are at holding data. The really good ones are labelled high density (HD), not so good ones are double density – no one uses single density any more.

In the old days disks were also distinguished by whether one or both sides could store information successfully so you got single and double-sided.

Modern computers no longer use single-sided or single-density disks. So for standard storage you need double-sided and double-density. This gives you 800k on a standard Acorn 'E' format disk. A single-density disk would only be really useful for 40 track storage.

High density disks have an extra hole opposite the write-protect hole and this is used by PCs and Macs to distinguish between double-density and HD. But the Arc does not make this distinction – you can format a normal double-density disk to the 1.6Mb standard although you might get a lot of disk errors.

In general we use double-density disks formatted to 1.6Mb standard then add Computer Concepts' CFS compression system to archive non-critical information in bulk – we can get up to 7.5Mb on the disk. We use CFS in preference to ArcFS (which would store more) because a disk fault will only lose one file not the entire archive file.

The difference between branded and bulk is simply that the bulk disks won't have a label on them such as Verbatim or Memorex. You just pay for the disk not the name. For the Acorn 32-bit machines the 40/80 track distinction is irrelevant as all the disk formats are 80 track.

from 4Mation or any number of other PD utilities designed to make programming in Basic easier.

Access to WordStar

AT college I use WordStar 6 on a PC. However, when attempting to transfer a WordStar 6 text file to Edit or FirstWord Plus – my primary objective is to load it into a desktop publisher – on my A3000 using DosFS v1 by Rob Schrauwen I find the text all there but scattered with strange characters such as [00].

My first instinct was to do a search and replace but with no success. I hope that you can help or maybe even know about a piece of software that could do the job. – **R. Rowles, Wherwell, Hants.**

● Saving an Ascii/text file on a PC and then loading it on an Archimedes – and vice versa – is quite simple but save the PC document as pure text without styles as this will save time.

Getting rid of [00] and similar things is quite simple in Edit. Load the text, click in the Edit window to set the caret and highlight the window. Press F4 then click on the Magic characters option. Depending on the version you have use either \x00 or X00 to replace the [00] or \x1f to replace [1f] and so on.

However, if you want to put the text into a DTP package why not opt for Impression which comes with special Loaders including one for WordStar. Load the relevant one then when you load your PC file into Impression it will automatically sort out the codes and so on.

A3010 upgrade

I WAS lucky enough to be able to sell my A3000 recently and have upgraded to an A3010 and I have some information to share as a seasoned user of Acorn machines.

*Firstly, and perhaps most obscure, is the fact that the *Speaker command does not work on the A3010 – there is no response at all. However, the internal speaker automatically disconnects when headphones are plugged in.*

My theory is that as the VIDC is integrated into the ARM250, extra protection is needed to stop this from blowing as if this happened a whole new processor would be needed. Therefore, when any external audio device is connected the internal one is disconnected to lower the strain on the VIDC chip. If anybody has the proper reason, I would be interested to hear it.

The TV modulator is superb. I was a bit apprehensive about returning to an RF modulated picture but once the TV had warmed up, the display is almost as good as that with a monitor and it was surprisingly easy to adjust.

One thing that does take some getting used to is the speaker that sits directly below the keyboard – having music blaring from the numeric keyboard is very unsettling.

Finally the speed increase is very welcome. For example when playing Guile on an ordinary A3000 it is a little slow but on the A3010 it is fast and smooth without being frenetic.

I have heard that the parallel port is at last bi-directional. Does this mean that I will be able to connect peripherals such as an IBM 5.25in disk drive to it or perhaps samplers that use the parallel port on the Amiga?

I also have a query about the joystick hardware. How do you get it to work? I have been trying games patiently and the only two that will respond to the joystick are Quest for Gold which comes with the machines and a demonstration of Nebulus.

I was under the impression that you could define the software in the rom to imitate any keypresses so it could be used with most games. No information was supplied with the computer so I am at a loss as to know what to do. – **Stephen Mumford, Lostock, Bolton.**

● Cutting out the internal speaker is precisely what the original machines *should* have done. After all why should you have to type *Speaker Off every time you plug in your headphones?

The printer port *is* bi-directional but you'll have to wait for products to become available: It's not just the hardware – someone has to write the software too. And remember the old range of machines don't have bi-directional printer ports even if they upgrade to Risc OS 3.10.

Now the joystick port. Games must be written to recognise the standard joystick interface designed by Acorn. This works along the same lines as the printer driver concept:

As far as application software is concerned it doesn't matter what printer driver is loaded the program always performs the same actions when printing, so you just get the right driver for your printer and what ever programs you buy will be able to print properly.

With the joysticks there is a standard interface and properly written software will work with any joystick system whether it's running on an A3010 with built-in ports, the RTFM joystick interface on an A310, a Leading Edge interface on an A4000 or whatever.

However the standard joystick interface is fairly new so any games more than three or four months old won't work. There's also no guarantee that all new games will conform to the standard, although of course they should.

You may be confusing the ability to configure key presses to joystick moves on the A3010 with the joystick software from Leading Edge which would require a separate hardware interface.

All programs printed in this magazine are exact reproductions of listings taken from the running programs which have been thoroughly tested.

However, on the rare occasions when mistakes occur, corrections are published as a matter of urgency.

Should you encounter error messages when you type in the program, they will almost certainly be the result of your own typing mistakes.

Unfortunately we cannot answer personal programming queries concerning mistakes. Of course letters about suggested errors will be investigated without delay, but any replies found necessary will only appear in these pages

Changing backgrounds

WHERE did Steve Turnbull get that background from? On pages 60 and 61 of August's magazine and page 38 of the September issue you show picture of a different backdrop. It looks a lot more interesting that the standard desktop from Acorn.

Please can we see the details of this? – **P. N. Young, Northallerton, North Yorkshire.**

● If you have Risc OS 3 all you have to do is drop a sprite file on to the Pinboard background, click Menu over the icon and select one of the *Make backdrop* options from the menu.

Save the desktop using the option on the Task manager icon (the acorn) at the far right of the icon bar.

If you have Risc OS 2 you can use the PD program !PlaceIt, available from all good PD libraries, in a similar way. But before you add the sprite to use as a backdrop, bear in mind the program by itself occupies 384k.

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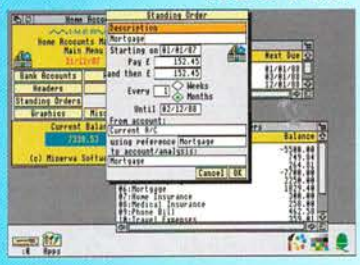

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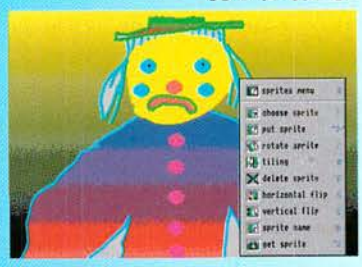

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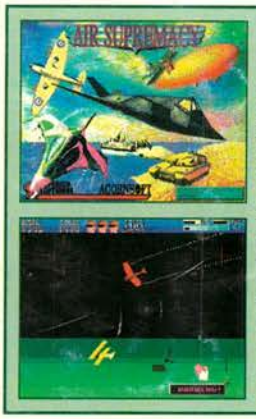

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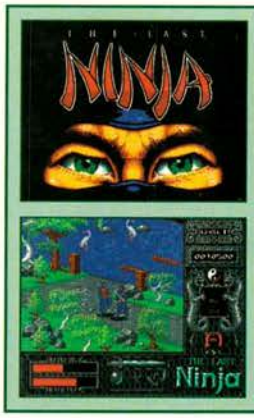

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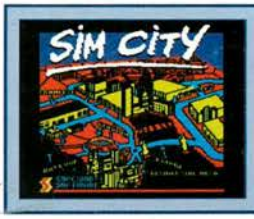

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(The screen pictures above show the BBC Master versions of the games.)

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